MIL-M-87268
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MILITARY SPECIFICATION
MANUALS, INTERACTIVE ELECTRONIC TECHNICAL: GENERAL CONTENT, STYLE, FORMAT, AND USER-INTERACTION REQUIREMENTS

This specification is approved for use by all Departments and Agencies of the Department of Defense.

1. SCOPE.

1.1 Scope. This specification contains common requirements for the general content, style, format, and user interaction features which are required for Interactive Electronic Technical Manuals (IETM). These IETMs are to be in digital form and are designed for interactive display to the maintenance technician or system opepator end user by means of a computer controlled Electronic Display System (EDS). This specification provides requirements governing the creation of IETMs and the development of IETM presentation software.

1.2 Paragraphs with limited applicability. This specification contains paragraphs and specific requirements which are not applicable to all Services. Such paragraphs or requirements are prefixed to indicate the Services to which they pertain: (A) for Army; (N) for Navy; (M) for Marines; and (F) for Air Force.

1.3 Introduction to the specification. The remainder of Section 1 of this document is included to provide an introduction to the requirements contained in Section 3 and a general description of the intended use of this document in the procurement of the emerging IETM products. The binding requirements of this specification are contained only in Sections 3, 4 and 5. The range of IETMs for which general requirements are described in this specification covers the maintenance, diagnostic, training, system operation, parts information, and installation functions which are required to achieve and maintain full operational capability of a specific weapon system or other military equipment. This specification can be applied to all levels of maintenance.

1.4 Interaction of the IETM and the EDS. An IETM must be constructed in such a way as to ensure that it is fully compatible with the operating and presentation software of an EDS, and must be presented on such a display device before any actual use, testing, or evaluation of operational suitability can take place (i.e., using the Government specified device which will be used by the end user to display the IETM). In this sense an IETM does not exist without its corresponding EDS and accordingly, each formatting and user interaction requirement cited in this

specification
should have a counterpart in the software section of any EDS specification.

1.5 Use of this specification. This specification is intended to be cited in a procurement in which the Government acquires specific IETMs to support some logistics support function (e.g., maintenance, training, or system operations) for a weapon system or other military equipment. This specification describes the general requirements the author of the IETM must follow concerning the creation and selection of general content, style, format and user interaction features of the IETM. However,
this specification is intended to be implemented in combination with the specific implementation style guides and detailed requirements specifications of individual end item IETMs (e.g., an IETM for a specific
functional area or a specific weapon system). These documents in turn reference this specification for the general IETM requirements which are common to the differing functional end item IETMs. This specification
is not a complete end item specification in itself.

1.6 Types of requirements covered by this specification. This specification
covers general requirements for IETMs in four categories which are outlined
below and presented in the major paragraphs of Section 3.

1.6.1 General content requirements. This specification defines general content requirements common to IETMs in 3.1, 3.2, and portions of 3.6. 3.1 applies specifically to the standard revisable data base items specified
in MIL-D-87269 which, in turn, are used to create the IETM. 3.2 applies to all IETMs whether or not they used MIL-D-87269 to specify the source data base. 3.6 includes content requirements which are peculiar to certain subsets of IETMs such as troubleshooting IETMs or proceduralized maintenance instructions. Content statements applying to the IETM are be classified into two types:

a. Those applicable to construction of the IETM such as those dealing with the IETM technical structure and those required to support use of a particular IETM (e.g., Help information)

b. Those applicable to specific technical processes to assure effective use of the IETM for the logistic support purpose intended

1.6.1.1 Common content requirements for IETM structure and supporting information. Common content requirements for IETM structure require the incorporation of such features as front (introductory) matter, list of contents, glossary, list of acronyms, statement of applicability, IETM number, IETM date, IETM edition, and many others.

1.6.1.2 Content requirements related to technical functions. This

type of requirement consists of standardized increments of technical content needed to ensure that the technical information presented in support of a given process is complete, comprehensible, and effective. Examples are the requirement that location drawings be incorporated to assist the user in remove and replace operations, or the requirement that setup information be incorporated for all system related procedural information. Similarly, content requirements such as the standardized requirements for parts information will be detailed under this category. Most of the requirements in this category are included in 3.6 of this specification.

1.6.2 General style requirements. The style requirements are presented in 3.3 of this document. The term "style" refers to two categories or requirements:

a. The nature of the language structure (grammar and syntax) used; the vocabulary; and criteria governing technical terminology, numbers, and abbreviations

b. The presentation related aspects of text, graphics, and audio information (e.g., graphics design, callout construction, and use restrictions on audio tones)

1.6.3 General format requirements. Format requirements deal with all aspects of the arrangement (organization) of text and graphics information for screen presentation, and with the sequencing (ordering) of frames for interactive presentation within an increment of technical information.
General format requirements of the IETM user interface are contained in 3.5 of this specification.

1.6.4 General user interaction requirements. General requirements for user interaction capabilities required for interactive presentation of IETMs (requirements which, as noted, must be reflected in the EDS) are contained in 3.4 and 3.5 of this document. The specific functions defined in these paragraphs are of two types:

a. In 3.4, those user interaction functions needed to control a screen display (e.g., windowing controls, cursor control, scrolling). (See 3.4, Table I)

b. In 3.5, those user-interaction functions which are required for the user to interact with the IETM and to obtain information from it (e.g., HELP, NEXT, BACK). (See 3.5.2.1, Table III)

2. APPLICABLE DOCUMENTS.

2.1 Government documents.

2.1.1 Specifications, standards and handbooks. The following

specifications,
standards and handbooks form a part of this document to the extent specified
herein. Unless otherwise specified, the issues of these documents are those listed in the issue of the Department of Defense Index of Specifications
and Standards (DODISS) and supplement thereto, cited in the solicitation (see 6.2).

SPECIFICATIONS

Military

MIL-M-38784 Manuals, Technical: General Style and Format Requirements (Appendix A only)

MIL-Q-87270 Quality Assurance Program: Interactive Electronic Technical Manuals and Associated Technical Information; Requirements for

MIL-D-87269 Data Base, Revisable: Interactive Electronic Technical Manuals, for the support of

STANDARDS

Military

MIL-STD-12 Abbreviations for Use on Illustrations, Specifications, Standards, and in Technical Documents.

MIL-STD-100 Engineering Drawing Practices

MIL-STD-1388/1 Logistic Support Analysis

MIL-STD-1388/2 Logistic Support Analysis Record, DoD Requirements for a

MIL-STD-1472 Human Engineering Design Criteria for Military Systems, Equipment and Facilities

MIL-STD-1840 Automated Interchange of Technical Information

(Unless otherwise indicated, copies of federal and military specifications,
standards and handbooks are available from the Standardization Documents Order Desk, Building 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.)

2.1.2 Other Government documents, drawings and publications. The following
other Government documents, drawings and publications form a part of this specification to the extent specified herein. Unless otherwise specified, the issues of documents not listed in the DODISS are the issues of the document cited in the solicitation (see 6.2).

Department of Defense

DOD 5200.1-R Information Security Program Regulations

DOD 5220.22-M Industrial Security Manual for Safeguarding
Classified
Information

(Application for copies should be addressed to the Superintendent of Documents, US Government Printing Office, Washington, DC 20402.)

2.2 Non-Government publications. The following documents form a part of this document to the extent specified herein. Unless otherwise specified,
the issues of the documents which are Department od Defense (DoD) adopted
are those listed in the issue of the DODISS cited in the solicitation. Unless otherwise specified, the issues of documents not listed in the DODISS are the issues of the document cited in the solicitation (see 6.2).

Aerospace Industries Association PUBS-119, Publications:

DoD Liaison Recommendation for Hazardous Materials Warnings
in Technical Data

(Application for copies of AIA PUBS-119 documents should be addressed to the Aerospace Industries Association, 1250 Eye Street NW, Washington, DC 20005.)

American National Standards Institute Publications:

ISO/IEC IS10744 Information technology - Hypermedia/Time-
based Structuring Language (Hytime)

(Application for copies should be addressed to the American National Standards Institute, 1430 Broadway, New York, NY 10018.)

2.3 Order of precedence. In the event of a conflict between the text of this document and the references cited herein, the text of this document
takes precedence. Nothing in this document, however, supersedes applicable

laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS.

3.1 General content requirements for the IETM data base. The Interactive Electronic Technical Manual Data Base (IETMDB) shall be constructed of composite nodes. These nodes shall comprise the basic units of information within the IETMDB. These composite nodes shall be composed of primitives, relationships (links) to other pieces of information, and context attributes as defined in MIL-D-87269. The primitives of which these composites are constructed shall include text, tables, graphics, and dialogs. A revisable data base developed according to the requirements of this specification shall conform to the general requirements listed herein and the specific requirements of MIL-D-87269.

3.1.1 Text. Textual information shall consist of alphanumeric data consisting of letters, words, sentences, paragraphs, numbers, greek letters, special characters (symbols), etc. Textual information shall follow the guidelines for style detailed in 3.3 of this specification. Textual information shall contain reference links to other information or those describing parts or graphics when those links are required to describe the IETM.

3.1.2 Tables. Displayable tables shall be represented as a series of separate entries, each entry being associated with a specific row and column intersection (cell) of a table. When it is necessary to associate a table entry with another information element or attributes, the entry (cell) shall refer (through a relationship) to the appropriate architectural element or primitive element in the IETMDB.

3.1.3 Graphics. Graphic information (e.g., drawings, illustrations) shall be hierarchical and consist of logically related groups of graphic primitives. Graphics data elements shall be composed of a series of these graphic primitives which are capable of being overlaid on each other to build a complete graphic. These graphics shall be the individual objects capable of being referenced in a node. Graphics shall be composed of information represented in accordance with one of the graphic standards included in MIL-STD-1840. Graphics shall include, but not be limited to, the following types: locator diagram, functional block diagram, general support graphic, schematic, wiring diagram, flow diagram, or graph/chart.

3.1.4 Dialogs. Dialogs shall be formulated as prompting questions which are intended to be presented by the EDS to the user. Dialogs shall be developed so that they require a user to respond (i.e., enter data) before any subsequent processing is undertaken. The dialog information in the IETMDB shall be formulated so that once a dialog is presented

to the user, and answered, certain assertions about the user's environment
are able to be made. The information associated with dialogs shall permit the presentation system to provide actions to follow all completed
dialogs. Each of the immediately subsequent procedures available for presentation to the user shall be conditional upon one of the possible answers requested by the prompt.

3.1.5 Element links. Specific information elements in the data base which have relationships to other elements, shall be represented by linking the information together. These links shall be developed to allow the user to branch from the immediate technical information to other related information. The links shall be of two types. The first type shall provide for a one to one direct relationship between two pieces of information. The second type shall provide for relationships to exist between several pieces of information. The links shall not be restricted to any one data type and shall be available for use with all data elements.

3.1.5.1 Links to reduce redundancy. Links shall be used to eliminate redundant information elements whenever practicable.

3.1.5.2 Location elements. The location elements used for internal references and external cross references shall be developed to conform to the location element definitions of ISO/IEC IS10744 as specified by MIL-D-87269. Other encoding formats shall not be used.

3.1.6 Context. Context dependent filtering, as defined in MIL-D-87269, shall be used to provide the capability to present the user with only the information that applies to a specific configuration or situation. This filtering shall be accomplished through the use of precondition and postconditon elements. The precondition element shall enable the display of appropriate information during presentation. The postcondition
element shall enable the recording of presentation events for later filtering. The IETMDB shall also contain the additional precondition properties which are required to be satisfied for the element to be applicable to the current context at presentation time.

3.2 General content requirements related to IETMs. This following paragraphs present general content requirements, both for technical information which shall be incorporated as the basic content of an IETM and for technical information which shall be incorporated to support use of a particular IETM. The following paragraphs on help information and for warnings, cautions, and notes shall relate to all aspects of the technical function of the IETM.

3.2.1 Help related to technical content. The user shall have access to additional information relating to the technical content of the IETM, such as information on the weapon system itself or assistance in using one of the special features of the authored procedures for that particular
weapon system. The help function shall also permit the user to access

context sensitive help which applies to the user's current activity and situation. It shall also permit the user to access descriptive information to further explain some technical point, to define a specific term, or to provide a fuller explanation of some process covered very briefly by the technical information. Help information shall be available for all sections of the IETM.

3.2.1.1 Administrative information. All IETMs shall contain the following administrative information for subsequent user selectable display:

a. Identification of the technical manual title, assigned technical manual number, and document version, as applicable

b. Classification level of the IETM (shall also be presented upon initial entry to the IETM by the user)

c. Date, baseline date plus date of latest and all previous changes, if applicable

d. Verification, change, or revision status, as applicable

e. Preparing activity

f. Activity with technical control of the IETM

g. Activity responsible for configuration management of the equipment/system

h. Address for forwarding deficiency reports or other evaluative comments

i. Method of obtaining additional copies and the format of those electronic copies

j. Distribution statement

k. Export control notice, if applicable

l. Summary of documents and/or technical manuals that are referenced in the IETM but not included in the automatically accessible data available to the IETM at the time it is used, if applicable

m. General notes describing the physical method for identifying the specific equipment to which this IETM applies, the method for identifying the change configuration status of equipment when not immediately obvious to a qualified user, and the relationship of the IETM to the particular equipment under maintenance

3.2.1.2 Applicability statement. The IETM shall contain a highly accessible applicability statement which explicitly identifies the specific system equipment, or component, to which the IETM applies, as well as identify the level of maintenance for which the IETM is intended (i.e., organizational, intermediate, or depot), if applicable. This information shall be in addition to the use of any automated feature of the EDS which displays only that information relating to one particular configuration. If the IETM applies only to certain individual members of a class of equipment, this fact shall be stated, and relevant model numbers, serial numbers, aircraft tail numbers, and the like shall be unequivocally stated.

3.2.1.3 Introduction. All IETMs shall contain information which explains the IETM purpose and scope (e.g., organizational level troubleshooting and corrective maintenance for a particular system), content, and organization. This section shall present the range of tasks covered by the IETM and relate the purpose and scope of the manual.

3.2.1.4 List of contents. The IETM shall contain a list of the contents of the IETM and shall provide instructions for direct user access to each item at the lowest level cited. If the IETM is a proceduralized corrective maintenance IETM, the list of contents shall provide a list of all maintenance tasks included. The list of contents, while analogous to the table of contents of a paper manual, shall base sequencing on the logic of the logistics support function covered and shall contain branching as needed. The user shall be given the capability to access the listed entries directly from the list of contents menu.

3.2.1.5 How to use "help" information. In addition to the technical information related help described in 3.2.1, the user shall be provided with help information involving the use of the IETM or the use of the EDS. This help information shall describe how to use the IETM; e.g., how to reach (access) specific information and how to employ user interaction functions. How to use this IETM information shall be incorporated as part of the content information for the IETM.

3.2.1.6 Instructions for interactions with IETM utility functions. Information shall be provided which describes procedures for all utility functions included as supplements to the primary functions of the IETM (e.g., preparation and submission of associated maintenance action reports; accumulation and submission of the IETM deficiency reports citing IETM errors or problems in using the IETM; ordering of needed parts; work center maintenance management; use for on station training; acquisition of additional IETM discs).

3.2.1.7 Definitions of acronyms and unusual terms. A glossary

including
all acronyms, abbreviations, and unusual terms shall be incorporated into the IETM and shall be directly accessible at all times during the IETM presentation.

3.2.2 Warnings, cautions, and notes. Technical information shall be supplemented with warnings, cautions, and notes in such a way so as: to attract the user's attention to practices, procedures, and conditions which could lead to injury or equipment damage; to warn the user against performance of certain hazardous actions; and/or to require specific steps leading to safe performance of the procedure. Procedures prescribed
for the operation and maintenance of equipment shall be consistent with the safety standards established by the Occupational Safety and Health Act, Public Law 91-596, and Executive Order 11807. The information included in warnings and cautions shall conform to the requirements of Appendix A of MIL-M-38784 to the extent that it is not in conflict with this specification. Appropriate warnings and cautions shall be included when it is impossible to avoid use of or exposure to hazardous chemicals, adverse health factors in the environment, or hazardous equipment.
warnings, cautions, notes, or other information to be highlighted shall:

a. Be integrated with the material to which it applies

b. Be apparent to the user as a warning, caution, or note by including an appropriate graphic cue which includes items such as icons, labels (e.g. "WARNING), or other visual cues

c. Contain all necessary information to reduce or alleviate the hazard

d. Be easy to read and understand in the work environment available

3.2.2.1 Safety summary. Every IETM which contains warnings or cautions shall contain at least one safety summary conforming to the requirements of Appendix A of MIL-M-38784 as cited above. When an IETM contains multiple major procedures, each of which is intended to be used independently
of the other procedures in the IETM, there shall be a safety summary for each major procedure.

3.2.2.2 Text of warnings and cautions. The textual information contained
in warnings and cautions shall be presented in simple words and in a straightforward, non-exaggerated manner. The content shall contain all necessary information needed to reduce or alleviate the hazard without
reference to additional information. Warnings and cautions shall not contain procedural steps other than those dealing with hazard avoidance and/or correction. The text of warnings and cautions shall contain the following information in the order indicated:

a. The specific nature of the hazard

b. The steps to be taken to avoid or minimize the hazard

c. The location of the source of the hazard

d. The consequences of failing to heed the warning or caution

3.2.2.3 Text of notes. Notes shall be written in accordance with the style requirements defined in this specification. Notes shall be used to supply needed information that is not a step in the procedure. Information
presented in notes shall be limited to necessary specifics. Required tolerances and clearances shall not be given as notes, but shall be included in the procedural steps.

3.2.2.4 Placement of warnings, cautions and notes. Warnings, cautions and notes shall be logically positioned at the points where they apply in accordance with the following rules:

a. Warnings and cautions shall be directly associated with and precede in logical sequence the text or procedural step to which they apply.

b. Notes shall either directly precede or directly follow the applicable text or step depending on the point to be emphasized. However, in the case of a procedural step, a note shall not follow the procedural step to which it applies.

3.2.3 Danger from multiple sources. When it is possible for one type of danger to come from any of several sources or one type of danger to require more than one remedial action, the danger may be referred to once in a single combined warning.

3.2.4 Health hazard precaution data. When hazardous chemicals or other adverse health factors are present in the environment or will appear during the performance of the procedure, and these health hazards can not be eliminated, appropriate warning and caution information shall be included in the technical information. Necessary protective devices for personnel shall be listed in the initial setup (input conditions) of the procedure and referred to in the appropriate subtask steps or warning/caution message.

3.2.5 Hazardous material icons. In constructing warnings and cautions relating to hazardous substances, icons in the Aerospace Industries Association Pubs-119 Publication shall be used when applicable.

3.3 General style requirements. IETMs shall be prepared in accordance with the general style requirements contained in this paragraph. These requirements shall apply both for the language to be used in textual technical information and for the graphics supplementing the textual portions.

3.3.1 Level of detail. Technical information shall contain all of the information necessary for a user to perform the task involved or to comprehend a description. The criteria required to define the specific level of detail shall be applied as specified by the procuring activity (see 6.2). The IETM shall not contain unnecessary detail above or below this level. However, in all cases the IETM shall retain enough information to permit the user to perform the documented maintenance without error or loss of time due to insufficient information. Unless otherwise specified by the procuring activity (see 6.2), procedures within steps shall be implemented as follows. When a general purpose procedure which can be performed without reference to technical information by a technician experienced in this procedure (e.g., "Open access panel") is referenced by a step, the user shall be given the option either to access the procedure before continuing with the current task or to bypass the procedure. When a procedure is peculiar to a task, or involves use of a peculiar piece of equipment, it shall be included in the procedural data and not made optional.

3.3.2 (A, F) Multiple skill level tracks. If specified by the procuring activity (see 6.2), technical information shall be available in each of two separate and complete tracks, each representing a differing level of detail: one level for a novice skill level and another for an expert skill level. The procuring activity shall provide the criteria to determine the target skill level for which the expert skill track shall be developed. The novice level shall contain all information necessary for an inexperienced user to perform the task involved or to comprehend a description. The expert level shall function as a checklist, presenting only the steps required to complete a task or providing a description in broader terms, requiring a higher level of theoretical knowledge. Both levels shall contain all pertinent warnings and cautions. The expert user shall be given the ability to access information at the novice level but the novice user shall not be given the capability to access information at the expert level unless otherwise specified by the procuring activity (see 6.2).

3.3.3 Comprehensibility. To ensure comprehensibility of the IETM data, the following principles shall be followed in authoring technical information:

a. Provide essential information in descriptive text:

(1) What is it (system, component, etc.)? Identify special or outstanding features.

(2) What does it do (what function does it perform)?

Include inputs, outputs, interface with other systems; emphasize end results.

(3) How does it perform its function? Include associated principles of operation.

(4) At what point in an overall system process does it function? (when does it perform its function)?

(5) Where is the component or part of interest located?

b. When procedural text is combined with graphics, use the following rules to abbreviate, so long as the meaning is not altered or obscured.

(1) Eliminate articles.

(2) Begin sentences with transitive verbs (action verbs).

(3) Use the imperative mood whenever appropriate. The only time subjects shall be implied is when they are unknown and the passive voice is being used or when the imperative mood is being used to give an instruction, order, or command, in which case the subject shall always be omitted (i.e., implied).

c. When it is necessary to indicate time, begin sentences with "when" clauses. Example: "When power supply voltage stabilizes..."

d. Limit paragraphs to a single idea. Limit sentences to a single thought; use no compound or complex sentences. Whenever possible, limit words to those that are short and familiar to the target audience. Eliminate long, complex sentences and paragraphs through the use of lists. The resulting parallel portions of sentences shall be individually listed as follows:

The beat frequency oscillator has three components:

(1) ...
(2) ...
(3) ...

e. Sentence length shall not exceed an average of 20 words. The average paragraph shall not exceed six sentences. The desired paragraph length is three to four sentences. Each paragraph shall have a topic entry or sentence. All material in the paragraph shall relate to and develop the topic sentence.

f. Except in unusual circumstances, construct steps and explanations

as fully integrated text and graphics modules. Key the explanatory text to the graphic.

g. Present descriptive text in a logical order (e.g., in operational sequence or in signal flow sequence) and include summary headers for individual paragraphs whenever needed for clarity.

h. Keep descriptive text consistent in terminology, style, and format throughout IETM data.

3.3.4 General style requirements for text. Text for an IETM shall be developed in accordance with the following style requirements.

3.3.4.1 Language considerations. Writing shall be factual, specific, terse, clearly worded, and simply illustrated, so that a user who has the required aptitude, training, and experience will understand it.

3.3.4.2 Use of imperative mood. The imperative mood and second person active voice shall be used in presenting procedural technical instructions which call for user action.

3.3.4.3 Proper amount of technical information. The IETM shall provide all the technical information required by a technician to perform the task documented in the IETM. It shall not contain any extraneous material not actually needed to perform the documented task. Additional helpful but not required information shall be included only in the form of user accessible HELP (see 3.2.1).

3.3.4.4 Nomenclature. Nomenclature used for names of equipment item assemblies, parts, etc., shall be in agreement with the approved nomenclature list prepared as part of the Logistic Support Analysis Record (LSAR) or other official maintenance specification, as applicable. Use of this nomenclature or its substitution with a standard shortened identifier (i. e., acronym) shall be consistent throughout the entire IETM and among all IETMs which apply to the weapon system or equipment involved. If specified by the procuring activity, standard shortened identifiers shall be substituted at all times when no confusion will result (see 6.2).

3.3.4.4.1 Nomenclature for tools and test equipment. When a tool, item of test equipment, item of support equipment, part, component, etc., has a common name in addition to its official nomenclature, the official nomenclature shall be used in the first occurrence in a task or procedure. The official nomenclature shall also be used for all titles, parts lists, support/test equipment lists, consumable/expendable lists, and work unit codes. Otherwise, the common name may be used in place of the official name in the IETM.

3.3.4.4.2 Nomenclature for controls and indicators. In procedures involving controls and indicators with panel nomenclature, these items shall be identified only by the placarding on the panel. Circuit reference designators (R105, C56, etc.) shall be omitted unless the reference designator itself appears on the panel or if two or more controls/indicators have identical panel nomenclature. If variations of panel or chassis nomenclature exist, a comment explaining that the panel names are typical and may vary slightly from one unit to another shall be included. In procedures involving controls and indicators with functional names only (no panel names), these items shall be identified by functional name.

3.3.4.5 Abbreviations. Use of abbreviations (including abbreviations for common units) shall be held to a minimum. Standard abbreviations shall be in accordance with MIL-STD-12. Each abbreviation shall be defined in the glossary contained within the IETM.

3.3.4.6 Consistency of units. IETM data shall be consistent in the unit of measure used by or associated with the equipment for which the IETM has been developed. If not otherwise specified on the equipment, measurements shall be in U.S. standard units (ounces, pounds, gallons, inches, feet, knots, miles, etc.). Units of measure shall be used for:

a. Temperature readings as marked on the equipment. If other than Fahrenheit, the equivalent in Fahrenheit shall follow parenthetically. General ambient temperature references, such as room temperature, shall be given in degrees Fahrenheit.

b. Speed, distance, and meter readings as marked on the equipment.
When the metric system is used on the equipment, conversion to U.S. standards of measurement shall follow in parentheses.
If specified by the procuring activity, conversion of U.S. standards of measurement to metric standards of measurement shall follow in parentheses (see 6.2).

c. Switch positions and panel markings exactly as marked on the equipment. However, symbols on panel markings, such as the symbols for "ohm" or "infinity," may be spelled out in textual references when they cannot be produced by the presentation system.

3.3.4.7 Numerical expression of tolerances. For all numeric measurement values which have tolerances, the optimal value shall be expressed along with the associated tolerances (e.g., 15 q 1.25 VDC, or 15 +4/-2 VDC). Tolerances shall not be expressed in percentages. All numerical values shall be given to the number of decimal places readable on the instruments

provided. For torque measurement, values shall be used that conform to the calibration of the tool being used.

3.3.4.8 Vocabulary (permitted words). If specified by the procuring activity, words used in the text of the IETM shall be limited to those contained in permitted word lists which are specified by the procuring activity (see 6.2). Words initially used by the IETM author, and identified during the contractor's Quality Assurance (QA) process, which are not on these lists, shall be eliminated and replaced with the "permitted" words, unless the comprehensibility of a given passage requires use of a "non-permitted" word. In such a case, the exception shall be submitted to the Government for approval of any "non-permitted" word. Terminology shall be used consistently throughout the IETM; e.g., the same word for a given tool must be used throughout the IETM.

3.3.5 General style requirements for graphics. Graphics for IETMs shall be developed in accordance with the general style requirements of the following paragraphs as they relate to individual graphics or to associations of both graphics and text. The quality requirements and level of detail requirements of these paragraphs shall apply to the display of the IETM on the least capable device (i.e., smallest screen) which is specified for use with the weapon system or equipments to be supported by the IETM (see 6.2).

3.3.5.1 Graphic conventions. Displayable graphics shall have a means for designating the minimum size at which that graphic is capable of being discerned when physically displayed and whether that graphic is permitted to be displayed using interactive functions. The requirements specified in paragraph 3.3.5 shall be satisfied in any graphic presented at that minimum displayable size. The particular encoding standards shall be that designated in the individual specification of specific IETMDB implementation and the designated presentation system. Graphics not designated as interactive shall require no manipulation to be viewed in full detail. Graphics designated as interactive shall allow the user to either manipulate the graphic for better view, or allow the user to select selectable areas within the graphic.

3.3.5.2 Minimum size for graphics. Graphics shall be displayed at no smaller scale than that required to meet the minimum displayable size which has been designated for each individual graphic.

3.3.5.3 Graphic density. Graphics shall show only that detail which is needed to support the action being described.

3.3.5.4 Quality of graphics. Graphics shall be prepared to a scale that ensures that all essential detail is legible. Line widths shall be of sufficient density to register sharply and clearly when displayed at the designated minimum size on an EDS.

3.3.5.5 Level of detail in graphics. Graphics shall present only the equipment items to which the action statements refer, plus sufficient surroundings to permit the user to locate and isolate the hardware item

without error.

3.3.5.6 Measurements and tolerances. Numerical measurements and tolerances shall be expressed in the same manner as that required for text in 3.3.4.6 and 3.3.4.7.

3.3.5.7 Textual citations of panel nomenclature. In all references on graphics to controls, control positions, test points, and indicating devices which have panel or chassis nomenclature, the nomenclature used in the textual label shall be displayed exactly as it appears on the panel or chassis (e.g., all capitals if used, spacing, and special symbols). Nomenclature shall not be enclosed in quotation marks unless required for clarity. In procedures involving controls and indicators with functional names only (no panel names), these items shall be identified by functional name. Unless otherwise specified by the procuring activity, all nomenclature used in graphics shall be identical to the nomenclature for the corresponding item on related text (see 3.3.4.4.2 and 6.2).

3.3.5.8 Angle of view. Graphics shall be drawn from the same general angle of view that the equipment presents to the user (for example, during a given step of a procedure). Cutaways and hidden lines shall be used as required in conjunction with details that are accessible but not visible to the user (i.e., as seen after removal of an access cover or after opening a cabinet door) and these views also shall be drawn from the user's orientation. In situations where the user is able to view the hardware from more than one angle, the view which provides the most pertinent and necessary information in the simplest fashion shall be used. An item or part removed from the system may be rotated to show important features; but the axis, direction, and degrees of rotation shall be indicated in the graphic. Perspective and isometric graphics shall be used for a more realistic view as opposed to orthographic projection, unless the view is head-on.

3.3.5.9 Use of the human figure. When it is necessary to illustrate an operation or procedure, graphics may include a human figure or parts of the body. Jewelry shall not appear in any graphics. The human figure shall not obscure details of the equipment necessary for a complete understanding of its operation. The human figure shall be clothed as specified by the procuring activity (see 6.2). A cross section of races and sexes shall be used.

3.3.5.10 Types of graphics. Where required to present maintenance procedures or descriptions, an IETM shall contain graphics to include, but not be limited to, such types as frontispiece (assembled view), isometric, perspective, and orthogonal.

3.3.5.11 Drawings. When engineering drawings prepared in accordance with MIL-STD-100 are used as a baseline in the development of graphics, unnecessary data which reduce the comprehensibility and clarity of the graphic shall be removed. Electrical and engineering diagrams shall be laid out functionally and shall be in accordance with the requirements of MIL-STD-100. Where information must be presented by means of a signal flow chart or circuit diagram, such visual aids shall be divided into discrete units, simplified, and standardized.

3.3.5.12 Schematic and wiring diagrams. Unless otherwise specified by the procuring activity, wire lists, schematics, and wiring diagrams initially displayed along with an associated text pane shall be simplified to contain only the information referenced by the text with which they are displayed (see 6.2). However, the technician shall have access to the entire wire list, schematic, or wiring diagram when that full graphic is available in the IETM.

3.3.5.13 Functional flow diagrams. Functional flow diagrams shall be drawn as flowcharts indicating the direction of system interaction. The information shall flow from left to right and top to bottom on diagrams. The diagrams shall indicate the detail referenced by the accompanying text.

3.3.5.14 Locator graphics. Locator graphics shall enable the user to find the specific hardware items (e.g., part, switch, control, indicator, assembly, etc.) referred to in the technical information. A locator graphic shall consist of a labelled graphic together with required callouts. The locator graphic shall show what a particular item looks like and illustrate its relationship to its immediate surroundings on the hardware illustrated. Locator graphics, when used, shall either be included as an option for selection by the user, or as an automated part of the presentation of procedural or descriptive information.

3.3.5.14.1 Placement of locator graphics. Placement of locator graphics shall be fully integrated with the associated technical information.

a. The individual equipment items (e.g., parts, switches, controls, indicators, and other items) shall be shown in physical context to the major equipment components of the illustrated hardware. The nomenclature of the major equipment component shall be shown on the graphic.

b. Index numbers on callouts shall be assigned on the equipment item locator graphic either: in clockwise sequence, or

in the sequence that the item is discussed in the procedural steps.

c. When reference is made to an illustrated equipment item in a procedural step, the step reference shall be keyed directly to the relevant equipment item (e.g., part, switch, control, indicator, or other item) by a callout reference citation from the text (e.g., item name) or an index number and a leader line pointing to the referenced item.

3.3.5.14.2 Successive locator graphics. Successive locator graphics may be used in lieu of a single graphic to lead the user systematically from the large, overall view to successively lower level views in a logical presentation sequence. Item exploded views shall be used as locator graphics only where further disassembly is required.

3.3.5.14.3 Format for locator graphic. The minimum size of the locator graphics shall provide sufficient resolution to enable the user to quickly identify the surroundings and the item to be located with respect to the surroundings. A callout shall be used to emphasize the item to be located.

3.3.5.15 Callouts. Callouts shall be provided to identify specific features of interest on graphics. Callouts shall consist of leader lines (with arrow heads) drawn from the index number to the equipment item. The following provisions for callouts shall be followed:

a. Callouts on graphics shall have a leader line connecting the number to the correct point on the graphic.

b. A callout shall only be displayed if it corresponds to the step currently highlighted in the text area of the display.

c. Callouts shall be keyed to the steps of a procedure or individual descriptive statements.

d. Callouts and identifier numbers shall not be crowded into spaces between graphic elements, and shall be clearly distinguishable from the graphic elements and each other.

e. Leader lines shall be straight rather than angled wherever possible.

f. Leader lines should not cross graphic lines if an alternative is possible.

g. When straight lines are not possible, the leader lines shall have one bend at an angle of 45 degrees. If the leader line has a 45 degree angle, it shall be drawn with

the
angled end pointing to the graphic. Leader line width shall be differentiated from graphic line width.

h. Use of part names or other graphic element identifiers may be used as a labels instead of index numbers but the labels shall be identical to that used in the associated text.

i. Leader lines shall not cross or come in contact with other leader lines nor shall they obscure essential details on the subject matter graphic.

3.3.5.16 Style requirements for animated information. The motion of the animated information shall be easily discernable by the user and clearly differentiated from the background and other static information
of the overall display.

3.3.6 General style requirements for audio information. Audio information
shall consist of nonverbal auditory tones, or computer generated or electronically stored speech. Whenever audio information is utilized, it shall always be accompanied by redundant, visual information in such a manner that the information presentation is effective when the audio output device not available. Audio information shall be presented in accordance with the requirements of MIL-STD-1472: Audio Displays, to the extent that it is not in conflict with this specification.

3.3.6.1 Requirements for nonverbal auditory tones. The use of nonverbal
auditory tones shall be limited to applications where its immediate discrimination is not critical to personnel safety or system performance.
The frequency of nonverbal auditory tones shall be within the range of 200 to 5000 Hz, preferably between 500 and 3000 Hz. A nonverbal audio tone shall be of sufficiently low intensity and duration so as not to startle listeners, add to overall noise levels, or interfere with local speech activity.

3.3.6.1.1 Nonverbal auditory tones in conjunction with error messages and alerts. If a nonverbal auditory tone is used in conjunction with a visually displayed error message or alert, it shall consist of a single
frequency and shall precede the presentation of the visually displayed message or alert by no more than 0.5 seconds.

3.3.6.1.2 Compatibility with ambient conditions. A nonverbal auditory tone shall be compatible with the ambient conditions in which the IETM is intended to be used. Nonverbal auditory tones which might be mistaken
for tones commonly found in the work environment shall not be used.

3.3.6.2 Requirements for computer-generated or electronically-stored

speech. The use of computer-generated or electronically stored speech shall be limited to the presentation of procedural information.

3.3.6.2.1 Pronunciation of abbreviations. Computer generated or electronicall
y stored speech shall be encoded to pronounce the entire word an abbreviation
represents (e.g., for the abbreviation "sec." the word "second" shall be pronounced). Computer generated or electronically stored speech shall be encoded to pronounce the individual letters of abbreviations of multi word phrases, without regard to case or punctuation, when that pronunciation is in common usage (e.g., for the abbreviation "A.D." (Anno Domino), the individual letters "a" and "d" shall be pronounced). When pronunciation of the individual letters of abbreviations of multi word phrases is not in common usage, computer generated or electronically
stored speech shall be encoded to pronounce each word the abbreviation represents (e.g., for the abbreviation "SSE", the words "south south east" shall be pronounced).

3.3.6.2.2 Pronunciation of acronyms. Any acronym used in the context of procedural information that either cannot be or typically is not pronounced as a whole recognizable word, shall be encoded by the computer
speech system as single letters (e.g., the acronym "APU" shall be pronounced:
"A-P-U").

3.3.6.2.3 Pronunciation of alphanumeric strings. Any strings of digits or alphanumeric characters used in the context of procedural information that typically are not pronounced as an intact unit shall be encoded as single spoken letters or combinations of numbers and letters (e.g., the reference designator A1A12A9 shall be pronounced: "A one A twelve A nine;" while the part number 78349015 shall be pronounced: "seven eight three four nine zero one five").

3.4 General requirements for common user interface. IETMs and the associated IETM presentation software of an EDS shall provide the display
formatting and user interaction functions described herein. The required
user interaction functions, which are written in uppercase throughout this specification, shall not be required to be employed as literal key names on an EDS device, but shall be treated as logical or "virtual"
functions which shall be implemented as specified for the particular display system. For example, the cursor movement and selection functions
can be optionally implemented by a mouse, a joystick, a track ball, a light pen, a touch panel, voice commands, or arrow keys with a selection
key. An OK function can optionally be implemented as a dedicated key labeled "enter" or a "soft" function key. This specification identifies the logical user input functions which shall be supported by the display

system, without specifying the exact keyboard or hardware requirements for the display system. Table I provides a list of the minimum user interface virtual functions and general definitions of those functions. These functions shall be implemented to permit the minimum functionality as described below. However, this shall not preclude additional detailed
requirements in an IETM presentation software specification which will further define the functionality.

3.4.1 Common user interface components. A common set of user interface components and presentation conventions shall be used to provide a consistent
user interface across all presentation devices. These user interface components and presentation conventions are common to most graphical user interfaces. The common interface components described in this specification shall be implemented on all of the various types of presentation
systems from a large screen device to a portable small screen device. The requirements specified herein shall apply to all types of devices unless specifically noted. The components cursor, windows, menus, controls,
dialogs and optional pointer shall be implemented as follows.

3.4.1.1 Cursor. If the information on the screen is capable of being selected, the system shall provide the user with the ability to select the information with a cursor. The cursor shall designate the position on the screen where the input is focused. The cursor shall be visually and consistently distinguishable from other information on the display. Selectable information shall be visually and consistently distinguishable
from the cursor and other information on the screen (e.g., by the use of a border or frame around the selectable object).

3.4.1.1.1 Selection by cursor. Selecting items in the client area by means of the cursor shall require use of the following steps: first the cursor is positioned on the item to be selected, then the SELECT function is used to indicate that this is the desired choice. As the cursor is positioned on an item, that item shall be highlighted. The IETM shall provide the user with a visual feedback of the selection. Selecting an already selected item shall deselect that item. The user shall be provided with the capability to select a single item, a range of items, or additional noncontiguous items, including multiple ranges of items. Once the user is finished, the OK function will end the selection
process and activate the selected items. In the case in which a user is required to select only one option, the SELECT function may activate the item without requiring the OK function.

3.4.1.1.2 Cursor movement. Selecting items on the display screen shall require the capability to move or position the cursor on the screen. The cursor shall be capable of being moved from one selectable piece of information to another such as from cell to cell in a table, from selectable word to selectable word in text, or from selectable object to selectable object in a graphic. The functions UP, DOWN, LEFT, and

RIGHT shall enable the user to move the cursor in the direction indicated.
If a free-form positioning device is not provided, the user shall have the capability to use the UP, DOWN, LEFT, and RIGHT functions to make detailed relocations of the cursor. In this case, the degree of precision
of the cursor control shall be sufficiently fine to allow movement of the cursor to any selectable region on the display screen.

3.4.1.1.3 Cursor shapes. Each cursor mode shall be indicated by the use of clearly discernable cursor shapes or icons.

3.4.1.1.4 Tab groups. In the event that several sets of selectable objects are displayed, the sets of objects shall be formed into fields called "tab groups". The cursor movement (and associated focus for any input) shall be constrained to within a single tab group. The TAB function shall allow a forward sequential movement of the cursor between tab groups. The BACK TAB function shall allow a reverse sequential movement of the cursor between tab groups. Examples of tab groups are: individual fill-in-the-blanks, groups of related choices, and dialog push buttons.

3.4.1.1.5 Pointer. If the system provides a free form positioning device, such as a mouse, the positioning device shall have a position designator (or pointer) and a POINTER SELECT function. The pointer shall be used in conjunction with the cursor. The pointer shall be used to rapidly relocate the cursor on the display. The system shall provide the capability for the user to move the cursor and select items with the pointer by placing the pointer on the display object and using the POINTER SELECT function to move the cursor and select the item.

3.4.1.2 Windows. A window shall be an area of the screen that displays information and provides the user with the functional means to communicate
with the IETM. The presentation system shall have the capability to display a minimum of three windows on the screen at one time, but only one window shall be active at any one time. An active window shall be designated by a highlighted title bar. The system shall provide the capability to open and close windows. The system shall allow windows
to be displayed overlapping each other, tiled adjacent to each other, and orderly stacked overlapping each other with title bars showing.
If a single window device is specified by the procuring activity, the IETM shall restrict the use of multiple windows, in which case the entire
display screen shall act as if it were the one and only window (see 6.2).

3.4.1.2.1 Window presentation. A window shall be composed of a minimum of a client area, a title bar, a menu bar, and window controls. Window controls shall not be required if the system has been specified as a single window system (see 3.4.1.2). For illustration of the basic window
components, see Figures 1 and 2.

3.4.1.2.2 Client area. The client area shall be the portion of the window in which the IETM content information is displayed. The client area shall be contained within the window frame and shall include one or more data panes or viewing areas displaying the text, tables, graphics,
etc. of the IETM information. The IETM contents shall be displayed in the client area. (The requirements for the client area are detailed in 3.5.1.)

3.4.1.2.3 Title bar and menu bar. The top area of every window shall consist of a horizontal title bar and a menu bar which, when displayed, appears immediately below the title bar. The title bar shall contain the title of the information being displayed. The title shall be displayed
in all uppercase. The menu bar shall appear only at the user's request. The detailed requirements for the menu bar are contained in 3.4.1.3. The title bar shall be highlighted when the window is active. When the single window option is specified by the contract (see 6.2), the title bar shall be capable of being toggled on and off with a menu bar (see 3.4.1.2). In this case, the title bar shall be initially displayed at the top of the window and the menu bar shall replace the title bar display only at the user's request.

3.4.1.2.4 Window controls. Whenever the information to be displayed requires a space larger than the available window area, the user shall be given the capability to manipulate the displayed information and/or window using the following window controls (see Figure 2). The need for this capability shall be minimized.

3.4.1.2.4.1 Scroll bars. Vertical and horizontal scroll bars shall be used to provide the user with the capability to SCROLL UP, SCROLL DOWN, SCROLL LEFT, and SCROLL RIGHT to manipulate the displayed information
(text, graphic, table, etc.). Scroll bars shall appear at the bottom of the data pane and at the right edge of the data pane with arrow marks at each corner. Scroll bars shall have the following components; a scroll region which is the background of the scroll bar and represents visually the length of the area that the user can scroll; a slider box which represents the data pane through which the user looks at the displayed
data; and stepper arrows which enable the user to scroll incrementally through the display. When the user uses a scroll bar to view information,
the information shall appear to move in the direction opposite to the movement of the slider box. For example, in a text data pane, if the slider box of a vertical scroll bar moves up, a text display seems to move down as previous lines in the information appear at the top of the data pane.

3.4.1.2.4.2 Window control options. If specified by the procuring activity, additional window controls shall be included as described below (see 6.2).

3.4.1.2.4.2.1 Window resize and relocation. The window resize function shall allow the user to adjust the location and physical display size of an individual window. Resizable windows in an IETM shall be initially displayed at the default size indicated for that display in the IETM. At any time during the presentation, the user shall be given the capability to alter the size of the active window. The control mechanism for resize function shall be located inside the window frame on one or more of the corners of the frame. Any window which is resizable shall have a distinctive border or consistent indicator which signifies that it can be resized. When a window is resized, the amount of text or graphic information it contains shall be increased or decreased (e.g. more of the graphic is shown when the window is enlarged). It shall not simply be rescaled. When changing the size of the window is not permitted, the resize border shall not be included as one of the window components.

3.4.1.2.4.2.2 Window menu button. A window menu button shall be located in the upper left most corner of the title bar and shall be used to activate the window menu.

3.4.1.3 Menu system. The user shall be given the capability to access all of the functions available on the system through hard keys, a footer bar, and/or a menu system. The menu system shall consist of a menu bar which shall control a hierarchy of pull down menus and a set of pop up menus. The window menu shall provide the standard location for window management functions.

3.4.1.3.1 Pull down menus. Pull down menus shall be displayed as a vertical column of selectable items. When active, titles on the menu bar of available pull down menus shall always be visible to the user.

3.4.1.3.2 Pop up menus. Pop up menus shall be displayed as vertical columns of selectable items. Pop up menus shall appear adjacent to the selectable item (if the selectable item has a menu associated with it).

3.4.1.3.3 Cascading menus. Cascading menus or submenus shall be used to add detail to pull down and pop up menus. Cascading menus shall provide a tree like structure for organizing information, thus simplifying the presentation of complex lists. Activating a cascading menu shall be accomplished by using the SELECT function within the submenu. If the selected function has any subfunctions, then another submenu shall appear and more selections shall be provided to the user. To maintain ease of use, the menu selection tree shall not be more than four levels deep. Menus shall be short-lived.

3.4.1.3.4 Menu presentation details. Menus shall appear quickly and exist only while a selection is being made. Menu items shall be displayed in uppercase and lowercase characters. The user shall not be given the capability to interact with any other part of the data until the

menu is removed. The user shall be given the capability to position the cursor or pointer on the menu item and use SELECT to activate the function. The user shall be allowed to exit any menu by activating the CANCEL function.

3.4.1.3.4.1 Menu width. The minimum menu column width shall be no less than five text characters. Menu columns shall be wide enough to enclose all menu item labels or options so that no option is truncated. Whenever a individual menu item is too wide for display in the client area, it shall be wrapped onto the next line. If the entire menu is not able to be presented within the client area, the existence of the menu data which is hidden and not displayed shall be indicated to the user.

3.4.1.3.4.2 Menu height. The minimum menu height shall be the height of two menu items (i.e., the menu title plus at least one menu item). The maximum displayed menu height shall be the height of the client area. Fonts and font sizes, line spacing between menu items, and allowable
margins between menu items shall conform to the requirements for the display and selection of text (see 3.4.2.1).

3.4.1.3.4.3 Menu border. The menu shall be drawn with a boundary extending
beyond the menu cells in order to distinguish the menu from the remainder
of the screen.

3.4.1.3.4.4 Highlighting. Highlighting shall be used to provide feedback
to the user whenever the cursor lands on a selectable menu item. Reverse
video (or similar brightness coding) shall be used to highlight the menu item after the item is selected.

3.4.1.3.4.5 De-emphasis. The system shall de-emphasize functions which are unavailable in the present context by using a gray out or dimming method. In cases where all of the menu selections of a specific menu are disabled the user shall not be given the capability to display the menu.

3.4.1.3.4.6 Organization of selections. Selections shall be grouped functionally or by frequency of use in accordance with MIL-STD-1472: User Computer Interface, alphabetically, or by some other reasonable organizational scheme which is apparent to the user. Commands which change system status or enter other input and can not be reversed shall not be displayed next to frequently chosen selections, whenever possible.

3.4.1.3.4.7 Cursor default locations. For all menus, the cursor shall be positioned at the same default location in a menu every time that menu is accessed.

3.4.1.3.5 Menu bar. When the menu bar is displayed, a single

horizontal
row of menu titles shall be displayed. Each title displayed shall be a unique descriptive textual label of one or more words which clearly differentiates that menu from the other menus in the menu bar. All of the functions available on the system and not included in the footer bar or on the existing hard keys for the presentation system (e.g., ENTER, TAB) shall be listed in menus on the menu bar and shall be accessible
by the user at any time. Footer bar options may also be duplicated in the menu bar.

3.4.1.3.5.1 Menu bar on single window screen device. When a single window device is specified by the procuring activity (see 6.2), the title bar and the menu bar shall be located in the same area with the ability that each be toggled on and off through a MENU function (see 3.4.1.2). The default information displayed in the top area of the window shall be the title bar. When the menu bar is displayed, the title bar shall disappear and vice versa. The user shall be given the capability to view either the title bar or the menu bar at all times.

3.4.1.3.6 Command interface. The system shall provide the user with a command interface using mnemonics or numeric entries as a means for making selections from menus other than by using the navigation and selection functions. The command interface for the selections from the menu bar shall be available at all times when the menu is active. When a single window device is specified by the procuring activity (see 6.2), the command interface shall be available only when the menu bar is displayed and active (see 3.4.1.2). Users shall be given the capability
to enter the required numeric key value(s) or mnemonic key combination that corresponds to displayed menu options to activate the command interface.

3.4.1.3.6.1 Mnemonic. A mnemonic shall be a single character, usually the first letter of the selection. The mnemonic for the various menus shall provide a visual cue to the user. When two selections in a menu begin with the same letter, a unique mnemonic for each selection shall be used.
When the mnemonic of the selection does not appear within the text of the selection, it shall be included in parentheses after the text. Mnemonics shall only be available when the menu containing them is displayed.

3.4.1.3.6.2 Numeric values. Numeric values may be used, as an alternative
to mnemonics, as a command interface. If numeric values are used, selection
numbers for menu bar titles and corresponding functions for use with the command interface in each menu list shall be separated from their text descriptors by at least one blank space. The numeric code and descriptive label for each choice on the menu shall be left justified relative to the boundaries of their respective column wise menu lists.

3.4.1.4 Dialogs and dialog controls. A dialog box shall be used as the principal means by which the user converses with the underlying IETM application software. It shall be displayed in a separate window, which may overlay the primary window, and shall contain a heading and one or more graphical controls (buttons). Dialogs shall be one of five kinds: alerts, fill-in-the-blanks, single/multiple choice, selection-in-list,
or composite. Dialog boxes shall appear in a consistent and prominent location on the display. All dialogs shall contain the OK function and, with the exception of information only alerts, the CANCEL function. The OK or the CANCEL functions shall finish the user interaction with the dialog box. The layout and arrangement of all dialogs shall allow the user to differentiate between the material they contain and other types of displayed information. See Figure 3 for examples of different types of dialogs.

3.4.1.4.1 Dialog cursor movement. The selectable only movement mode shall be used when filling in dialogs. The cursor shall move only to items which require input from the user.

3.4.1.4.2 Dialog presentation. Headings used in dialog boxes shall be distinctive such that they cannot be confused with response alternatives,
labeled control options, guidance messages or other displayed material. Headings used in dialog boxes shall be placed in close proximity to their respective response alternatives (i.e., buttons). When the dialog heading does not contain an explicit question terminating in an question mark, the heading shall end with a colon (":") to signify that selection of a response alternative is required.

3.4.1.4.3 Dialog push buttons. Dialog boxes shall contain graphical controls called push buttons. A push button shall be a selectable word or graphic icon on the screen which enables the user to make a selection or initiate an action. The push buttons displayed in the dialog box shall be large enough so the user is able to position the cursor on the push button for selection. Push buttons or choices shall provide visual feedback when a user selects that push button or choice in a dialog box. Push buttons shall be found on every type of dialog. They shall each be single action entities. Push buttons shall indicate selections
made or invoke a general action like CANCEL or OK. Push buttons shall each appear as a consistent shape, (e.g., box, circle, or arrow) with the name of the selection or action written inside of the shape.

3.4.1.4.3.1 Usage of push buttons. When presented with a dialog box, the user shall be required to complete the dialog or acknowledge its presence. The method of completing a dialog transaction shall be the use of push buttons. This shall be done by moving the cursor onto the push button and activating the SELECT function. After selecting the preferred options, the user shall have at least two push buttons located in the bottom of the box. The two buttons shall have the following functions "OK" and "CANCEL". "CANCEL" shall be equivalent to the CANCEL function and shall be used to cancel the dialog box. The "OK" function shall communicate to the application software that the user has

completed
the dialog.

3.4.1.4.3.2 Push button presentation. Common push buttons ("OK", "CANCEL", and "HELP") shall be displayed along the bottom of the dialog box. The common dialog buttons shall correspond to a completion of action, which is the last selection the user makes before leaving the dialog box.

3.4.1.4.4 Alert dialogs. Alert messages shall include warnings, cautions,
and notes; any message, communication, notice, or output which requires manual acknowledgement by the user; or message generated as a result of erroneous user inputs or sequence control actions. Alerts shall be used to provide information regarding the processing status of user inputs and requests. They shall also be used to provide information about the status of the system's internal components (e.g., low battery power, improper functioning of the operating system or memory module).

3.4.1.4.4.1 Alert information content. Alerts shall be brief, consistent,
strictly factual, informative, and written in the active voice. Alerts shall be constructed using neutral words that do not imply or ascribe blame to the user, "personalize" the computer, or attempt to make the content of the information humorous. Alerts regarding calls to erroneous
or potentially destructive external systems shall be displayed to the user. Following user interrupt of a data processing or a database navigation/s
equencing command (e.g., CANCEL), an advisory message shall be displayed to assure the user that the system has returned to its previous status.

3.4.1.4.5 Choice dialogs. A choice dialog shall be the type of dialog in which the user is required to make one or more selections from a group of choices. A choice dialog shall consist of either a single choice dialog or multiple choice dialog or a combination of the two.

3.4.1.4.5.1 Single choice (radio buttons). Selectable items that are mutually exclusive (i.e., only one item from the list can be selected at any one time) shall be presented as a single choice dialog constructed
using radio buttons. Radio buttons shall be grouped into lists of mutually
exclusive choices. Each radio button shall appear as a consistent shape (e.g., a circle) and shall be marked with a visual indicator when the button is selected.

3.4.1.4.5.2 Multiple choice (check boxes). A multiple choice dialog shall be the type of dialog in which one or more selections are able to be made from a group of choices. Multiple selections shall be made using check boxes. Check boxes shall be grouped into lists of non-mutually
exclusive choices. The user shall be given the capability to check one or more of these boxes as needed using the cursor or number

selection
technique. Each button shall appear as a consistent shape (e.g., a square) and shall be marked with a visual indicator when the button is selected. Check boxes shall employ different shapes from radio buttons.

3.4.1.4.5.3 Choice dialog presentation. Radio buttons and check boxes shall be left justified and separated from text descriptors by at least one blank space. If there are so many choices in the dialog box that the choices have to be placed in columns, the check box or radio button position shall be left justified with respect to its columnwise position.
Each response alternative listed in a dialog box shall be given, at a minimum, a short descriptive label of one to five words (including acronyms, abbreviations, special characters and symbols, etc.) that clearly differentiates it from the other alternatives.

3.4.1.4.6 Fill in the blank dialogs. This shall be the dialog type that provides for the input of alphanumeric characters in response to displayed questions and/or data entry fields (e.g., inputting user identificati
on data when signing on to the computer system; entering the title and/or
number of database frames that contain errors or discrepancies, etc.).

3.4.1.4.6.1 Fill in the blank presentation. For all fill in the blank type dialogs, data entries shall be prompted explicitly by displayed labels for data fields. The user shall be given the capability to DELETE
or otherwise change previously filled in entries.

3.4.1.4.7 Selection in list. The selection in list shall provide the user with the means of manipulating large lists of data to a point where the user can highlight an item and take some action on the item. The selection in list shall enable the user to choose from an existing list of items that is either long or variable in length. In addition to the standard features of all dialogs, the selection in list shall have at least two additional characteristics: a window that contains the content listing; and a vertical scroll bar in those cases when the list will not entirely fit within the window.

3.4.1.4.8 Composite dialog. A combination of the previous types of dialogs may be located together in one composite dialog box.

3.4.2 Display formatting and user interaction requirements for standard data types. The following paragraphs describe the standard data types (text, graphics, tables, and user prompts) that shall be displayable in the client area. When standard data types are individually displayed in data panes, these data panes shall have the capability to be linked to form one logical unit of technical information display within a single
window frame.

3.4.2.1 Text. Textual information shall consist of alphanumeric data

consisting of letters, words, sentences, paragraphs, numbers, etc., in accordance with style guidelines described earlier in this specification.

3.4.2.1.1 Display of text. Textual information shall be displayed in data panes of the client area. Text shall be displayed in uppercase and lowercase characters.

3.4.2.1.1.1 Character font. All fonts shall contain both uppercase and lowercase sans-serif letters, numbers, and special characters. The smallest character size shall be no less than a height of 16 minutes of arc at the reference viewing distance or a height and width of 7 and 9 pixels, respectively, whichever is larger. Standard sizes shall be based on this viewing angle subtended at some given viewing distance (reference distance). Table II lists the minimum and recommended character heights for various reference viewing distances and shall be used to determine the appropriate character font size. Unless otherwise specified by the procuring activity, the reference viewing distance shall be 36 inches (see 6.2).

3.4.2.1.1.2 Character spacing. Intercharacter spacing in textual displays shall be no less than 0.1 character height.

3.4.2.1.1.3 Line dimensions. Between word spacing for textual displays shall be one (nominal) character width. Between line spacing for textual displays shall be 0.33 of character height exclusive of superscripts and subscripts and no less than 0.15 character height when superscripts and subscripts are displayed.

3.4.2.1.1.3.1 Text panes. The width of the text pane shall range from 30 - 60 characters per line. Whenever possible, the width shall be 40.

3.4.2.1.1.4 Margins. Margins shall be required for all text panes to prevent information from being obscured by borders or the information in adjacent panes.

3.4.2.1.1.5 Justification. Left justification shall be used for all lines of text displayed as sentences or paragraphs.

3.4.2.1.1.6 Word wrapping. The system shall wrap lines of text, so that no line will extend beyond the limits of the pane or right margin. Lines shall be broken only between individual words or within a word when that word is explicitly hyphenated. If the text is resized, the system shall wrap the lines of text so that no line extends past the right margin. If the resized text exceeds the text pane area, vertical scrolling shall be used.

3.4.2.1.1.7 Hyphenation. Hyphenation shall not be used to display normally non-hyphenated words on successive lines.

3.4.2.1.1.8 Highlighting text for selection. The system shall have the ability to highlight (e.g., by color change, brightness variance, image reversal, font change) selectable textual information on the screen.

3.4.2.1.2 Selection of text. The user shall be given the capability to select a highlighted character string (i.e., one that is indicated as selectable) by positioning the cursor on or near that string and activating the SELECT function.

3.4.2.1.2.1 Scrolling. When the text to be displayed exceeds the length of the data pane, the text shall be made scrollable and a vertical scroll bar shall appear at the right of the pane to provide the user with a visual cue that the capability to scroll the displayed information exists.
The user shall have the capability to manipulate displayed text by using the SCROLL functions. As a minimum, the user shall have the capability to move through textual information, one line at a time, through the use of the SCROLL UP and SCROLL DOWN functions.

3.4.2.2 Graphics. The IETM shall display graphics in a data pane as follows.

3.4.2.2.1 Display of graphic overlays. The IETM shall be given the capability to display encoded graphics along with any associated callout overlays designed to be displayed with the graphic to indicate the specific components of the graphic.

3.4.2.2.2 Types of graphics. The IETM shall have the capability to display two type of graphics, static and interactive. Static graphics shall be displayed in full detail in the graphic area provided, with no ability for manipulation. Interactive graphics shall permit manipulation and the IETM shall provide the user with the ability to perform this manipulation of the graphic.

3.4.2.2.3 Scale. Graphics shall be displayed to a scale at least as large as its designated minimum size so that all essential detail is legible.

3.4.2.2.4 Graphics display. Graphics shall be displayed in an assigned data pane of the displayed window. If a graphic can not be displayed in its entirety and in full detail, it shall be displayed using interactive graphic display techniques described in this specification (e.g., scrolling, zooming).

3.4.2.2.5 Selection of graphics. The user shall be given the capability to select a point, area, or the entire graphic by positioning the cursor

on or near that point and activating the SELECT function. Selectable regions of a graphic shall be visually distinct and shall not adversely affect the appearance of the graphic. The selection of graphical information
shall include, but is not limited to, the following:

a. Selecting an individual graphic object, such as a part, displayed in a graphic

b. Selecting a point or rectangular area in a graphic image

3.4.2.2.6 Manipulation of graphics. If the graphic is designated as scrollable, the user shall have the capability to activate SCROLL, ZOOM, or FULL SCREEN functions to manipulate a graphic. These options shall be available whenever the graphic exceeds the size of the data pane.

3.4.2.2.6.1 Scroll functions. The user shall have the capability to scroll graphical information through the use of the SCROLL UP, SCROLL DOWN, SCROLL LEFT, and SCROLL RIGHT functions. When graphics exceed the size of the screen, scroll bars shall appear to provide the user with a visual cue that the capability to scroll the displayed information
exists.

3.4.2.2.6.2 Zoom functions. The system shall provide the capability to enlarge or reduce the displayed graphical information. The enlargement
capability shall be provided to the user by activating a ZOOM IN function.
The user shall have the capability to reduce the size of the information being displayed by activating a ZOOM OUT function. The size of the data pane shall not change as a result of using the zoom functions.

3.4.2.2.6.3 Center. The user shall have the capability to activate a CENTER function which would relocate the center of a graphic to the point that the position cursor indicates without scrolling.

3.4.2.2.6.4 Full screen. The user shall have the capability to enlarge a graphic to the full size of a client area by activating the FULL SCREEN
function.

3.4.2.3 Tables. Tabular information shall be displayed as cells of textual information or a graphic. When tables contain textual elements, those elements shall conform to the requirements set in this specification
for textual information. Graphical elements within a table shall conform
to the requirements in this specification for graphic material.

3.4.2.3.1 Display of tables. Tables shall be displayed in a left to right, top to bottom array of cells. Tables shall have column headers and, if applicable, row headers.

3.4.2.3.1.1 Justification. Lists of alphabetic data shall be vertically aligned with left justification. Numerical data shall be justified with respect to a fixed decimal point. In cases where there is no decimal point, the numerical data shall be right justified.

3.4.2.3.1.2 Column spacing. Consistent column spacing shall be maintained within a table. When data are displayed in more than one column, the columns shall be separated by at least two blank spaces if right justified, and by at least three blank spaces otherwise. For multiple occurrence fields with group headings, at least three blank spaces shall appear between groupings.

3.4.2.3.1.3 Row spacing. For dense tables with more than ten rows, a blank row or other grouping feature (e.g., a solid line) shall be inserted after at least every five rows.

3.4.2.3.2 Highlighting. The system shall have the ability to highlight selectable information within a table on the screen. Tables which have active selection portions shall display highlighted areas and the entire highlighted area shall be sensitive to selection using a locator device. All selectable areas shall be displayed and be visually highlighted before selection.

3.4.2.3.3 Selection of tables. The user shall have the capability to select an individual highlighted cell displayed in a table.

3.4.2.3.4 Scrolling of tables. The user shall have the capability to manipulate displayed tables by activating a SCROLL function if the table exceeds the size of the data pane. When a table is made scrollable, the table headers shall not scroll within the pane. The user shall have the capability to scroll tabular information a row or column at a time, through the use of the SCROLL UP, SCROLL DOWN, SCROLL LEFT, and SCROLL RIGHT function. When tables exceed the size of the screen, scroll bars shall appear to provide the user with a visual cue that the capability to scroll the displayed information exists.

3.4.2.4 User prompts/questions. User prompts shall be displayed as dialogs (see 3.4.1.4.5). Prompts shall be used to obtain any information required by the IETM from the user. Prompts shall be presented to the user as questions.

3.4.2.4.1 Display of user prompts. A standard symbol or layout shall be used with prompts to indicate to the user that an explicit response (i.e., entry) is required. The symbol or layout shall only be reserved for that purpose. The user's data entry area shall be displayed in the immediate vicinity on the display as the prompt or question.

3.4.2.4.2 Manipulation of user prompts. When responding to multiple prompts in a single section of a procedure, the user shall be provided

the capability to change a previously entered response to any given prompt to the extent that that change does not alter the logic of the procedure. When the user changes a response to any given prompt, the user shall have access to all of the current entries for that prompt.

3.4.2.5 Audio controls. When either verbal or nonverbal audio signals are presented, the user shall have the capability to request that the audio signal be repeated. The user shall have control over the audio volume and the on-off control of audio presentation.

3.4.2.6 Video controls. When displaying a motion video sequence, the video sequence shall automatically begin after the entire screen has been displayed. The IETM shall provide the user with the functions for pausing, repeating and exiting the video sequence.

3.4.2.7 Motion/animation controls. If displaying an animated graphic, the animation sequence shall automatically begin after the entire screen has been presented. The EDS shall allow the user to pause, repeat, and exit the animation sequence.

3.5 General formatting and user interaction features for the display of IETMs. IETMs shall be displayed by an EDS which shall have the capability
to form displayed windows of information formed in accordance with this paragraph by combining primitive information components each individually
displayed using the general display formats described in 3.4. In addition
the final IETM shall conform to the detailed presentation requirements unique to the procedural, descriptive, fault isolation, or parts information
portions of IETMs as specified in 3.6. The general formatting and user interaction requirements of the following paragraph shall apply to all IETMs.

3.5.1 General display formats for IETMs. The content of the IETM shall be displayed within the client area according to one of the presentation templates described below. The individual data panes, the footer bar (function-designation area), the second header line if required, the message area if required, the alerts for warnings cautions and notes, and the designation of classified information shall be displayed within the client area (see Figure 4).

3.5.1.1 Window layout templates for data panes. Window components shall be displayed in one or more individual data panes within the client
area. Data panes shall consist of rectangular display regions containing
information in the form of text, tables, graphics, etc. displayed individually
or in combination in the client area. All information shall be displayed
in individual data panes and combined into a full window display in accordance with the window arrangement rules in 3.5.1.4. Divided panes

need not be of the same size. Explicit lines shall be drawn between window panes. Data panes shall not overlap each other upon initial presentation to the user (see Figure 5). Data panes shall be allocated to the display area within the client area of a window in accordance with one of the following templates.

a. One full client area pane.

b. Two panes divided top and bottom.

c. Two panes divided left and right.

d. Three panes divided top and bottom with bottom pane subdivided left and right.

e. Three panes divided top and bottom with top pane subdivided left and right.

f. Three panes divided left and right with the left pane subdivided top and bottom.

g. Three panes divided left and right with the right pane subdivided top and bottom.

h. Four panes divided top and bottom with each part further subdivided left and right.

3.5.1.2 Arrangement of data panes. Windows shall be composed of one or more separate data panes and shall be combined and/or displayed according to the following rules:

a. A window consisting of a single data pane composed of any combination of text, table, or graphics is permitted.

b. A graphic pane shall be large enough to satisfy the minimum size designated for the individual graphic whenever possible. If the graphic pane is smaller than that minimum size, the graphic shall be made scrollable and the graphic shall be scaled so that the visible portion of the image appears at least as large as if the entire image were displayed at the designated minimum size for the graphic.

c. When displaying one text pane and one graphic pane (or table), the text and associated graphic shall be kept together on the same window.

d. When displaying one text pane with multiple graphics (or tables), all text and graphics shall be arranged on one window whenever possible. If all graphics will not fit on a

single window, the information shall be broken into a sequence of separate windows (each with the same text and as many graphics as will fit), rather than scrolling multiple graphics on the same window. There shall not be more than one user scrollable graphic pane in a window or on a single window. The graphics shall be broken up into separate windows before scrolling of multiple panes is employed.

e. Text always begins in the upper leftmost corner of its data pane.

f. When text refers to a graphic, the graphic shall be displayed whenever the associated text reference is displayed.

g. When the above rules will not allow a text pane plus all of the associated graphics panes to fit in one window, the set of panes shall be split up into several separate windows, each retaining the same text pane but with differing graphic panes. In such a case, the user shall be given the capability to move through the sequence of combined text/graphic windows without the relative position or the displayed content of the text pane changing.

h. Appropriate use of white space (i.e., space in the color of the background) shall be implemented so that the eye is guided horizontally and/or vertically through the window with lines formed through use of white space and display elements.

i. Margins shall be at least one character width around any image.

3.5.1.3 Footer bar (function designation area). Unless another location within the window is specified by the procuring activity (see 6.2), the footer bar shall be located at the bottom of the window frame within the client area. All active selectable options (i.e., available interaction functions) which are directly related to the performance of a maintenance procedure shall be displayed in the footer bar area. Functions which are not active for the displayed window shall be visually distinguishable from active functions or not displayed in the footer bar area. The footer information shall be displayed in a region that is at least two character cell heights tall and as wide as the window. The footer bar shall be used in conjunction with the menu bar to display interaction options to the user.

3.5.1.3.1 Support of function keys. The footer bar shall be designed to support delivery devices which use programmable or dedicated function

keys and the footer bar shall cue the user that particular functions are assigned to physical keys and that those keys are active; however, it shall also support interfaces that use the marked region in the footer
bar as an active function selection or button area. Active function selection areas of the frame shall be in the footer bar area and not elsewhere in the client area (i.e., frame) unless a dialog box or other active window is superimposed on the frame.

3.5.1.3.2 Visual prompts in the footer bar. The selectable options shall be indicated using function name, icons, programmable function key labels (e.g., F2), or other visual prompts and shall be enclosed in a box outlined with a visual border (e.g., line, shadowed button image) in the footer bar area. Icons with no attached verbal description
shall be included without the surrounding border. There shall be any number of such boxes in the footer bar and they shall be lined up horizontally.

3.5.1.3.3 Labels of visual prompts. When a software function is assigned
to a particular function key, a label containing the hard key function label or the programmable function key number (such as "F8") along with a succinct description of the function shall be displayed in the footer bar area. The same function shall appear in the same region of the footer bar even if this requirement calls for some blank space to be reserved in the bar when a particular function is not active.

3.5.1.3.4 Footer bar menus. When they exist, footer bar menus shall be activated from the function designations in the footer bar and shall be either attached (i.e. in the pull down format) or pop up in accordance
with the formats described in 3.4.

3.5.1.4 Optional second header line. If specified by the procuring activity (see 6.2), the top line in the client area shall be reserved for additional header information. The format of this line shall be compatible with the title bar. If the MENU function is used to toggle the title bar also, then the toggle shall apply to both the title bar and the second header line.

3.5.1.5 Optional message area. If specified by the procuring activity (see 6.2), a message area shall be reserved at the bottom of the client area above the footer bar. The requirements for the messages to be displayed in area shall be as specified by the procuring activity (see 6.2). Messages shall be displayed in this same area of the window whenever
such a message is displayed.

3.5.1.6 Display requirements for warnings, cautions, and notes. Warnings,
cautions, and notes and their associated icons shall be displayed prominently
in the display area and shall be treated as an alert with the following

particular formatting requirements. The associated message shall be displayed in the approximate middle of the client area, and normal operation
of the system shall not resume until the message is acknowledged in accordance with the requirements for an alert. Upon user acknowledgment,
the alert shall be erased and the procedural information presented. When it is necessary to display a combination of warnings, cautions, and notes, order them in the following sequence: warnings, cautions, and then notes.

3.5.1.6.1 Color of warning, caution and note displays. Where color is used for display, message colors shall be red for warnings, yellow for cautions, and cyan for notes.

3.5.1.6.2 Borders of warnings, cautions and notes. The borders of warnings, cautions, or notes shall consist of diagonal bars, alternating between the background color or white, and the designated message color. The appropriate word identifying the message type shall appear in capital
letters (e.g., "WARNING," "CAUTION," or "NOTE"). The identifying word shall appear horizontally and vertically centered on the upper border of the warning, caution, or note (see Figure 6).

3.5.1.6.3 Icon and title. One or more icons representing a warning, caution, or note shall appear in the footer bar.

a. Icons for hazardous materials shall be designed and used in accordance with the Aerospace Industries Association Service Publications Committee PUBS-119 and MIL-M-38784 Appendix A wherever applicable.

b. An applicable icon shall remain displayed in the footer bar until the warning, caution, or note message it represents
is no longer applicable. The user shall be given the capability to view the warning, caution, or note in its original appearance and functionality at any time by selecting
the icon.

c. When a message has a title, it shall be horizontally centered
one character cell height below the bottom of the icon or to the immediate right of the icon.

3.5.1.6.4 Text. The contents of warnings, cautions, or notes shall be displayed within the border. Messages containing two or more paragraphs
shall have a blank line between paragraphs.

3.5.1.6.5 Format for danger from several sources. When warnings or cautions exist in separate categories for the same set of technical information, they shall be successively displayed in decreasing order

of severity: Warnings first, followed by cautions. Warnings or cautions
in the same category shall be successively displayed. However, there shall be no requirement to determine an order of importance within the same category. When related warnings or cautions of the same category exist for the same block of technical information, it is permissible to group them within a common border but they shall be visually distinct.
In such a case the title shall indicate the combined danger.

3.5.1.7 Indication of classified information. Whenever classified information is displayed, an indication of the classification level shall be indicated in the footer area (see 3.5.1.1). The indication shall be the upper case spelling of the words corresponding to the classificati
on level (e.g., CONFIDENTIAL or SECRET). When color is available, these indications shall be displayed with a red background. The classification
indication shall be clearly distinguishable from the function indicators in the same area. Technical data developed using this specification shall have security classification markings in accordance with DOD 5220.22-M
and 5200.1-R. No classification indication shall be required for unclassified
IETMs.

3.5.2 User interaction functions with IETM. The purpose of this paragraph
is to specify in detail the standard user interaction functions required for IETMs, presenting both the minimum requirements and some standard optional functions. This specification does not exclude the addition of other functions. In addition to the common user interface functions previously described, the presentation system software shall provide the capability for the user to activate this set of standard functions for selecting, manipulating, accessing, navigating, and entering data in the system. These shall be considered virtual functions which will be implemented in different ways by different presentation systems (e.g.,
one presentation device might have dedicated keys for each standard function, another presentation device might provide software programmable
function keys, a third presentation device might use a pointing device such as a mouse to select the standard functions from a menu bar).
The user shall be given the capability to select and activate all of the standard input functions described herein.

3.5.2.1 Required navigation functions. The user shall be provided with a comprehensive set of commands to navigate and sequence through the information. The following are the minimum set of navigation and control functions which shall be available to the user and common to all IETMs. These functions shall permit the minimum functionality as described below. (See Table III.)

3.5.2.1.1 NEXT. The NEXT function shall display the next section or

frame of information that the user requires, based on the context of the situation.

3.5.2.1.2 BACK. BACK shall be the opposite of NEXT. The BACK function shall display the previous module or frame of information from which the user came. Upon using BACK, the system state shall be reset if any system variables have been recorded or set, with the end effect being as if the user never left the window to which the user BACKs. All information relative to the current window shall be reset. If relevant,
a message box shall be presented to the user explaining any special circumstances which cannot easily be reversed associated with invoking BACK.

3.5.2.1.3 BROWSE BACK, BROWSE NEXT, and BROWSE EXIT. These functions shall be required for all systems for which the NEXT and BACK functions set interactive system variables which are used to effect subsequent navigation through the IETM. These navigation functions shall act as NEXT and BACK, but shall not set or reset system variables automatically or through dialogs. Once either BROWSE BACK or BROWSE NEXT is selected, other navigation functions shall not be available until the user returns to the window from which the BROWSE function was activated by invoking the BROWSE EXIT function. The presentation system shall provide a distinct
visual indication that the system is in browse mode. When either the BROWSE BACK or the BROWSE NEXT function is not logical (such as at the beginning of a string or at a mandatory branch point), only the complementary
BROWSE function shall be active. System variables shall still be set and shall be activated and logged to a temporary state table; however, it is not necessary to post these variables to the permanent state table when in browse mode.

3.5.2.1.4 RETURN. If the user branches, the RETURN function shall enable the user to revert to the location prior to branching. Pressing RETURN shall perform an orderly exit from the branched information presentation, resetting all temporary system state information relative to the branched node. If a branch has not been previously taken, this key shall be nonfunctional.

3.5.2.2 Required data access functions. In order to access individual portions of large sets of information, such as an entire IETM, there shall be multiple data access paths provided to the user including, as a minimum, the following access methods.

3.5.2.2.1 Bookmarks. The user shall have the capability to record a bookmark to mark a displayed information element for later recall. These marks shall be recorded either at a point to allow recall to the same information element (e.g., step in a procedure) or at a point to recall the beginning of a logical sequence containing that information (e.g., beginning of a procedure or subprocedure). The user shall be given the capability to view CREATE, DELETE, MODIFY, and GOTO bookmarks (see Table III). When setting a bookmark, the user shall be given the capability to name the bookmark with a unique alphanumeric name.

3.5.2.2.2 System index. The user shall have the capability to access information by using a hierarchical outline or index included in the IETM information.

3.5.2.2.3 Functional diagrams. The user shall have the capability to access information through the use of a functional diagram or graphic when that information is contained in the IETM. Through the diagram, the user shall be given the capability to move the cursor to the graphic display of the function of interest and activate the SELECT function.

3.5.2.2.4 Search and direct access. The SEARCH function shall enable the user to search for, and directly access, information by entering selection information into a dialog box.

3.5.2.2.5 Level of detail. If a separately authored track of more or less detailed technical information is available in the IETM (see 3.3.2), the technician shall have the capability to activate the MORE DETAIL or LESS DETAIL function within the parameters allowed by the technician's skill level.

3.5.2.2.6 Cross references. Whenever a displayed information element has cross references or related information identified, the presence of those cross references shall be indicated to the user and the user shall be given the capability to access that related information. When that cross reference is selected, a new data pane or window of information
shall appear on the display. The user shall be given the capability to exit the cross reference information and return to the original information
display by using the RETURN function.

3.5.2.2.7 Help. The system shall provide a help information display function for the user. The help function shall permit access to the following help elections to the extent applicable.

a. CONTEXT. Provides context sensitive help about the specific situation that exists or the information being displayed on the system when the help was requested.

b. HELP. Provides information on how to use the application's help facility.

c. WINDOW. Provides general information about the operation of the window from which the help was requested.

d. KEYS. Provides information about the function keys and other keyboard features.

e. SYSTEM. Help related to use of the computer system being used to view the IETM.

f. INDEX. Provides an index with a search capability for all help information.

g. TUTORIAL. Provides access to a tutorial.

h. GLOSSARY. Provides the meaning of terms, acronyms and abbreviations contained in the IETM.

3.5.2.3 Other functions. If specified by the procuring activity, other system functions shall be made available to the user (see 6.2).

3.6 Special requirements for major information types. The following types of information have certain special requirements in addition to the general requirements of 3.2 through 3.5. The major information types detailed below include:

a. Procedural information.

b. Troubleshooting information.

c. Parts information.

d. Descriptive information.

3.6.1 Requirements peculiar to procedural information. Procedural information shall be directive in form. It shall be used to instruct an end user how to operate, test, or repair a system; or carry out a logistics support procedure. It shall include information provided in a step by step manner so that technicians are able to carry out the processes of weapon system operation, fault verification, fault isolation,
corrective maintenance, planned maintenance, installation, inspection, checkout, and test. Procedural information shall include, but not be limited to, three basic types of information:

a. Mechanical procedure. Used to present mechanical instructions
for such activities as disassembly, lubrication, repair, periodic maintenance, packaging and shipping, etc.

b. Operating procedure. Used to present operating instructions for all anticipated operating conditions, including, but not limited to, such activities as starting, placing in operation, operating, placing on standby, and shutting down.

c. Test procedure. Used to perform all test, checkout, and inspection functions for such activities as operational checks, periodic maintenance checks, alignments, calibration checks, etc. In general, a test or checkout procedure assesses the operational condition, including fault verification,
of a single part, equipment subsystem, etc.

3.6.1.1 Content requirements for procedural information. Procedural technical information shall include the individual directive information

elements (i.e., steps) of the procedure plus additional supporting material
which is presented as an essential part of the procedure information presentation.

3.6.1.2 Organization of content for procedural information. Procedural information shall involve the presentation of maintenance information in a step by step fashion. The structure for procedural technical information
shall divide the procedures into tasks, subtasks, and steps. A task is a collection of subtasks directed toward accomplishment of a specific objective. Each new task or subtask shall begin on a new display. In terms of content, each task shall involve closely related activities. Each subtask shall include all steps required to achieve a specific objective. While all steps in this task are closely related, the subtasks
are generally done sequentially, and their specific objectives differ.

3.6.1.3 Title and label requirements for procedural information. The following title and labeling information shall be associated with procedural tasks and subtasks. It shall be used primarily for window labeling upon presentation.

3.6.1.3.1 Task title. Wording of the task title shall be identical with the wording used in the task description in the detailed task analysis
summary of the LSAR as specified in MIL-STD-1388. If no LSAR task title is available, the task title shall consist of a noun or noun-phrase object followed by a verb. It shall be a concrete, specific, terse title that uniquely identifies which increment of maintenance performance
the task involves. Each task title shall be unique.

3.6.1.3.2 Subtask title line. A subtask title line shall consist of an uppercase title and may have a subtask number (Arabic). If numbered, subtasks shall be numbered sequentially throughout a task. A subtask title shall be structured in the same manner as a task title and uniquely
identify the material which it heads. Subtasks shall be divided into as many steps as needed.

3.6.1.3.3 Step number. Each step shall be presented with consecutive Arabic numerals. The approval of the procuring activity shall be required
to use any alternate numbering system (see 6.2).

3.6.1.4 Supporting material for tasks. In addition to the individual steps for a task, the procedure shall contain the following information, which shall be displayed before the steps are viewed.

3.6.1.4.1 Procedure applicability statement. Any procedural task presented
shall refer only to the equipment model range or sequence to which the particular item of procedural technical information applies. When a

procedure to be presented does not apply to all existing models, or may vary from model to model, this fact shall be prominently stated and the applicable equipment model range identified. Such terms as "on later equipment" and "on early serial numbers" are not acceptable. When a procedure does not apply to all models, the IETM system shall also incorporate the requirement that the technician enter the applicable system or equipment model number, serial number, or other unique system identifier, as applicable, in such a way that only entry of the appropriate number will permit the sequential presentation of procedural information to proceed. If this information has been entered earlier in the use of the IETM (e.g., on login) and that information is available at the time the procedure is presented, reentry of the information shall not be required. Such a control shall be based on established designations, such as model designation, part number, serial number range, or similar means. Indefinite categories such as "early serial numbers" or "some late models" shall not be used.

3.6.1.4.2 Initial setup. The initial setup or input conditions, where required, shall be provided at the beginning of every new task. The initial setup lists information the technician must know before starting a task. All lists provided as part of the initial setup shall be headed by individual underlined labels, using upper case initial letters with successive letters in lower case. Information presentation in each window shall avoid crowding; as many frames shall be used for each initial setup as necessary. The initial setup or input conditions shall include the following items.

3.6.1.4.2.1 Test equipment required. A listing of the government approved test equipment applicable to the required task shall be provided. Equipment shall be listed by nomenclature and Joint Type Electronics Designation System (JTEDS), or Aeronautical Equipment Identification Designators (AEID) type designation, if assigned, or commercial or manufacturers designation if the JTEDS or AEID type is not assigned. The description shall include equipment capacity, range, etc. If alternate equipment can be used, the term "or equivalent" shall follow the nomenclature. If no test equipment is needed, the entry shall state "None". If an equivalent alternate piece of test equipment cannot be used, the notation "No Substitution" shall follow the item name and description.

3.6.1.4.2.2 Tools required. A list of tools by name, part number and Commercial and Government Entity (CAGE) code or manufacturer's name and address if code is not available, or the citation of a special tool kit, along with its number, shall be provided. If commonly available alternative tools are equally applicable, they shall be listed as well.

3.6.1.4.2.3 Materials, consumable/expendable items, mandatory replacement parts. Sealant, lubricants, replacement lamps, gaskets, seals, cotter

pins, lockwire, etc., are considered consumable/expendable items. A list by name, part/specification number, and CAGE code or manufacturer's name and address if code is not available, of all necessary consumable items, support materials, and mandatory replacement parts, together with the quantity or size needed, when applicable, shall be provided. If no materials, expendable items, or mandatory replacement parts are required, the entry shall be "None".

3.6.1.4.2.4 Support equipment required. A list by name, part or model number and, CAGE code or manufacturer's name and address if code is not available, of support equipment required to perform the task, including
ground support equipment for aircraft maintenance, shall be provided. If no support equipment is required, the entry shall be "None". The number of items of each type of support equipment shall also be provided.
Examples of such support equipment include stands, auxiliary power, jigs, lights. If an equivalent alternate piece of support equipment can not be used, the notation "No Substitution" shall follow the item name and description.

3.6.1.4.2.5 Personnel required. The minimum number of technicians required to perform the task safely and effectively shall be provided. When more than one person is required for a given procedure, a general description of the relative role of each technician in performing the tasks and a designation of his location and responsibilities shall be provided. Action requirements providing individual task duties shall be spelled out in detail in the actual task descriptions. Personnel listed shall be identified in terms of their specialties (Air Force Specialty Code [AFSC], Military Occupation Specialty [MOS], Navy Rate and Rating) whenever possible. This information shall correspond to that provided by the LSAR if the LSAR is available.

3.6.1.4.2.6 System preparation checklist. A checklist of all procedures
which should be performed by the technician to assure that all preparations
have been completed prior to the start of the procedure, particularly those involving personnel safety and prevention of equipment damage shall be provided. When no system preparation checklist is required (e.g., one has been presented in the previous task statement), the entry shall be omitted.

3.6.1.4.2.7 Special environmental conditions. A list of any special environmental conditions needed shall be provided. These conditions shall include but not be limited to, ventilation, lighting, temperature, noise level, Electromagnetic Interference (EMI), cleanliness, air conditioning
and humidity.

3.6.1.4.2.8 General safety instructions. A safety summary of any general
safety information that applies throughout the task shall be provided.

3.6.1.4.3 Safety considerations in presenting procedural information. All procedures shall be made as safe to perform as possible. To more greatly assure safety, the following guidelines shall be observed:

a. Whenever possible, actions shall be accomplished with equipment in a shut down and isolated condition. Specific subtasks and steps describing the shut down process shall be included.

b. No task or subtask ending shall leave any portion of the equipment in a dangerous condition unless adequate warnings are posted for all individuals likely to be affected.

c. Steps directing removal of voltage or pressure shall be explicit as to which switches or valves are intended and shall include any instructions to install a warning or status tag on the switches or valves in the same step.

d. Where components capable of holding a charge are included in the circuitry, steps shall be provided to direct discharge of such components.

e. Task procedures shall include steps to restore equipment to a safe operation condition, with appropriate tests to ensure that the steps involved have been successfully accomplished.

f. Warnings shall be prominently inserted in the procedural statements wherever needed. Requirements that the technician attach warning labels to equipment being worked on shall be included in procedural steps wherever indicated.

3.6.1.5 Style requirements for procedural information. Language shall be free of both vague and ambiguous terms and shall use the simplest words which convey the intended meaning. All essential information shall be included in the IETM, and shall be made readily accessible to the user.

3.6.1.5.1 Types of procedural statements. Procedural information shall be presented using action statements or indication statements.

a. Action statements: Action statements shall consist of an action verb and an object or item upon which action is to take place. Statements presenting steps in mechanical procedures shall use only action statements.

b. Indication statements: Indication statements shall present the name of an indicator which the user reads or observes and the indication which should be obtained. The indication shall be the normal or expected visible behavior when the equipment is functioning properly. Any values and tolerances necessary to evaluate the reading shall also be given. Statements presenting steps in

operating
and test procedures shall use action statements followed by indication statements.

3.6.1.5.2 Simultaneous actions or indications. Procedures for simultaneous
actions or indications shall be included in the same step.

3.6.1.5.3 Standard statements for steps. Standard sentences for presenting
steps shall be used where statements are very similar, as in the case of repetitious steps and test equipment instructions. For example, sentences used for repeatedly directing use of a particular item of test equipment may be the same except for the:

a. point of test

b. expected result

c. "Where-to-go-next" statement

3.6.1.5.4 Avoidance of superfluous information. Any procedural statement
shall present only the information necessary for completion of a task or information which is directly helpful in preventing an error. A statement of a subtask step shall be limited to:

a. a single operation

b. repetitions of a single operation or,

c. several operations which must be carried out simultaneously

3.6.1.5.5 Procedures involving more than one person. Procedures requiring
more than one person shall be presented in a manner which integrates the actions and observations of each person into a single sequence of steps. The instructions for each action and observation composing a step shall identify the user responsible for accomplishing it and each step shall be prefaced by a precise statement as to who is to perform it. More specifically, procedures shall be prepared identifying tasks for more than one user when it involves any of the following situations:

a. Cooperation, coordination, or other teamwork is necessary under the direction of a single supervisor

b. Large or heavy items must be handled, a procedure which would be dangerous or difficult for one person

c. One user must make observations or take actions in conjunction
with actions of another primary user, at some location out of sight or reach of the primary user

3.6.2 Requirements peculiar to troubleshooting information. The fundamental logic for interactive troubleshooting shall not be dictated by the IETM presentation system but shall be based on a specifically designed troubleshooting logic which shall include, but not be limited to, predefined fault isolation sequences and dynamically generated fault isolation recommendations based on system or user inputs.

3.6.2.1 Content requirements for troubleshooting information. Troubleshooting information shall be designed to permit direct access to the relevant corrective maintenance procedures after a fault has been isolated. Unless otherwise specified by the procuring activity (see 6.2), information shall include, but not be limited to, the following types:

a. symptoms

b. procedures

(1) tests
(2) repairs
(3) removals
(4) scheduled maintenance or service
(5) access

c. graphics, locator diagrams and schematics

d. parts and test equipment information

e. equipment failure history

f. theory of operation

3.6.2.2 User interaction requirements for troubleshooting information. The user shall be given the capability to enter symptoms manually by means of symptom codes or human readable text, or by initiation of automatic retrieval from the system or equipment under observation. The user shall be given the capability to enter and change test results when such information is required by the troubleshooting procedure. The user shall be given the capability to confirm conditions or states that are required before continuing a maintenance action. The user shall be given the capability to review and browse through previous actions and test results. The user shall be given the capability to access all troubleshooting information needed to troubleshoot the system in an efficient and clearly defined manner.

3.6.2.3 Requirements peculiar to predefined fault isolation sequences. Predefined fault isolation sequences shall consist of a prespecified sequence of fixed procedures and tests that will lead to the suspected fault. These predefined fault isolation sequences are representative

of the fixed fault trees in fault isolation manuals and shall be based on the reporting of an observed symptom or the result of a previous test. The input of the result (or outcome) of a test or an observation shall be required before displaying information on the next procedure, test, or corrective maintenance action.

3.6.2.4 Presentation requirements for predefined fault isolation sequences.
Presentation of predefined fault isolation information shall consist of and be presented as procedural data (see 3.6.1). The procedural steps shall contain test instructions, observation requirements, and corrective
repair actions. Prompts via dialogs shall be used to initiate actions requiring user input.

3.6.2.5 Requirements peculiar to dynamically generated fault isolation recommendations. Dynamically generated fault isolation recommendations shall be computed, as required, with information received from user input and/or automated system recording. The fault isolation system shall provide the user with the option to select a recommended test or repair action to perform that will aid in the fault isolation process.
Results from these maintenance actions shall be used to update the status
of the current situation producing additional recommendations if necessary.
Recommendations shall be based on computations based on a variety of input data including, but not limited to, historical information, heuristics,
probability factors, and cost factors such as time or availability.
The models for dynamically generated fault isolation recommendations shall be based on a computed process which shall involve one or more automated approaches including, but not limited to: model based reasoning,
dependency models, fault based reasoning, rule based logic, information theory, or advanced artificial intelligence schema.

3.6.2.6 Presentation requirements for dynamically generated fault isolation
recommendations. Presentation of dynamic troubleshooting information shall be interactively displayed to a user. A starting point for dynamic
troubleshooting of a system under investigation shall be depicted in some representative form such as a functional block diagram, connectivity
block diagram, or iconic form. These depictions shall convey information about the current components under investigation and the suspected faults.
Interaction with the depictions shall be required to obtain additional information such as, but not limited to, lower levels of system detail, theory of operation, supply status, associated graphics, and part information.
Presentation of system information shall be hierarchical in nature.
It shall include automated user access to additional system wide

information
which shall include, but not be limited to, block diagrams of all subsystems
and the complete set of test and repair procedures, symptoms, and parts. The information presentation shall not be limited to a single set of troubleshooting recommendations but shall include user options for viewing
a variety of troubleshooting information such as a best test or best repair list, previous actions performed during the troubleshooting process,
test results, and block diagrams.

3.6.3 Presentation of parts information. All IETMs shall incorporate a data base of supporting parts information [of the type which, in conventional
technical manuals, has been included in a separate Illustrated Parts Breakdown (IPB) or Repair Parts and Special Tools List (RPSTL)]. In general, the IETM shall have the capability of accessing parts information
to: permit unambiguous identification of all replaceable or reparable parts authorized at the current level of maintenance; show precisely the physical relationship of this part to other parts of the system; and provide to the technician all data required to order the part through
the use of the automatically prepared parts ordering form. Each part shall be presented using line graphics, and these graphics shall show the physical relationship of the part to adjacent parts.

3.6.3.1 Accessibility of parts information. Access to parts information
shall be made available at the point in the IETM presentation that a specific part is identified including, but not limited to:

a. a locator diagram

b. parts shown on any logic flow diagram or circuit diagram

c. parts cited in the text of the technical information

d. a dialog prompt for parts related information

e. any citation in the IETM using a part designation in any of its available forms

3.6.3.2 Direct access of parts information. Parts data shall be accessible
by direct entry of applicable part identification/numbering systems [(e.g., catalog number, stock number, supplier number, part name, System/Subsystem/Subject Number (S/S/SN)].

3.6.4 Descriptive information. Descriptive information, which is generally
supplemental information to assist the user in the comprehension of procedural data, shall be presented as part of an IETM. Examples of

descriptive information shall include, but not be limited to, theory of operation, diagrams, and general knowledge. This specification shall not impose rigorously limited requirements on the display of descriptive information. Descriptive information shall be presented in a usable and easily understandable format when displayed on an EDS. Additional paragraph or section headers shall be employed as needed to assist in the identification and organization of descriptive data such as theory of operation.

4. QUALITY ASSURANCE PROVISIONS.

4.1 Responsibility for inspection. Unless otherwise specified, the contractor shall be responsible for the performance of all inspection requirements (examinations and tests) as specified herein. Except as otherwise specified in the contract or purchase order, the contractor may use his own or any other facilities suitable for the performance of the inspection requirements specified herein, unless disapproved by the Government. The Government reserves the right to perform any of the inspections set forth in this specification where such inspections
are deemed necessary to ensure supplies and services conform to prescribed
requirements.

4.1.1 Responsibility for compliance. All items shall meet all requirements
of Sections 3 and 5. The inspection set forth in this specification shall become a part of the contractor's overall inspection system or quality program. The absence of any inspection requirements in this specification shall not relieve the contractor of the responsibility of ensuring that all products or supplies submitted to the Government for acceptance comply with all requirements of the contract.

4.2 Quality Assurance. Quality Assurance for the IETMDB creation or the preparation of any IETM itself shall be in accordance with the requirements of MIL-Q-87270.

5. PACKAGING.

5.1 Preparation for delivery. Unless otherwise specified by the procuring
activity, items shall be packaged in the most economical manner that will provide adequate protection during shipment in accordance with accepted industrial packaging procedures.

5.1.1 Digital product packaging. Packaging of encoded computer products,
in preparation for delivery, shall be in accordance with the requirements
of MIL-STD-1840.

5.1.2 Classified material. Classified material shall be packaged and identified in accordance with DOD 5200.1-R, DOD 5220.22-M, and the implementing

Service regulations.

6. NOTES.

(This section contains information of a general or explanatory nature that may be helpful, but is not mandatory.)

6.1 Intended use. IETMs prepared in accordance with this specification are intended for use in the installation, operation, maintenance, repair,
and logistics support of equipment/systems or for accomplishments of assigned mission of users.

6.2 Acquisition requirements. Acquisition documents must specify the following:

a. Title, number and date of the specification.

b. Issue of the DODISS to be cited in the solicitation, and if required, the specific issue of individual documents referenced (see 2.1.1, 2.1.2).

c. Specification of the end user skill level to which the IETM is to be developed (3.3.1).

d. If procedures within steps shall be other than as specified herein (3.3.2.1).

e. If a separately developed higher skill level track shall be used, what the criteria shall be for determining the higher skill level, and if the expert user is to be prohibited
from accessing the lower skill level track (3.3.2).

f. If shortened identifiers for nomenclature (i.e., acronyms) shall be used and what they shall be (3.3.4.4).

g. If conversion of U.S. standards of measurement to metric standards of measurement shall be included (3.3.4.6 b.).

h. If the use of permitted word lists is required and, if so, the lists to be used (3.3.4.8).

i. The least capable device which is to be supported by the IETM (3.3.5).

j. If nomenclature used in graphics shall be other than as specified herein (3.3.5.7).

k. How the human figures used in graphics are to be clothed (e.g., Enlisted working uniform for a particular Service) (3.3.5.9).

l. If simplification criteria (i.e., limited to the components

referenced in the associated text) of wire lists, schematics, and wiring diagrams is other than as specified herein (3.3.5.12).

m. If a single window device shall be used (3.4.1.2).

n. If the additional window controls (i.e., window resize, relocation, and menu button) shall be required (3.4.1.2.4.2).

o. If the reference standard viewing distance used to determine the minimum text font size shall be other than as specified herein and, if so, what reference distance shall be used (3.4.2.1.1.1).

p. If the footer bar location shall be other than as specified herein (3.5.1.3)

q. If an optional second line is in every window header and what information is required to be displayed on that line (3.5.1.4).

r. If an area is to be reserved on the display window for the message area and any particular requirements for that message area (3.5.1.5).

s. If standard user functions for controlling the IETM other than those specified herein are required, and a specification of those additional functions (3.5.2.3).

t. If step numbering shall be other than as specified herein (3.6.1.3.3).

u. If content requirements for troubleshooting information shall be other than as specified herein (3.6.2.1).

v. If responsibility for inspections shall be other than as specified in this document (4.1).

w. If packaging shall be other than as specified herein (5.1).

6.3 Acquisition of IETMs. To acquire the IETMs described herein, this specification must be listed in the appropriate Service's Technical Manual Contact Requirement (TMCR). The TMCR must also include or list any other detailed IETM requirements needed to supplement this general specification. The TMCR must, in turn, be listed in the Contract Data Requirements List (DD Form 1423), except where DoD FAR Supplement 27.475-1 exempts the requirement for a DD Form 1423.

6.4 Definitions of acronyms and terms. Acronyms and IETM terms are included below.

6.4.1 Acronyms.

a. ALHRD - Armstrong Laboratory Human Resource Division
b. AFMC - Air Force Materiel Command
c. AMSC - Acquisition Management System Control (number)
d. ANSI - American National Standards Institute
e. AN/AEID - Aeronautical Equipment Identification Designators
f. CAGE - Commercial And Government Entity code (number)
g. CALS - Computer-aided Acquisition and Logistics Support
h. CDM - Content Data Model
i. DID - Data Item Description
j. DLA - Defense Logistics Agency
k. DTD - Document Type Definition
l. DTMB - David Taylor Model Basin (Dept. of Navy)
m. EDS - Electronic Display System
n. GCSFUI - General Content, Format, Style, and User-Interaction (Requirements)
o. IETM - Interactive Electronic Technical Manual
p. IETMDB - IETM Data Base
q. IETMQA - IETM Quality Assurance (program)
r. IPB - Illustrated Parts Breakdown
s. ISO - International Standards Organization
t. JTEDS - Joint Type Electronics Designation System
u. LSA - Logistics Support Analysis
v. LSAR - Logistics Support Analysis Record
w. MTBF - Mean Time Between Failure
x. RRSTL - Repair Parts and Special Tools List
y. SGML - Standard Generalized Markup Language
z. STD - Standard
aa. TI - Technical Information
bb. TMSS - Technical Manual Specifications and Standards (standardization program)

6.4.2 Alert. An Alert is any message, communication, notice, or output which requires manual acknowledgement.

6.4.3 Caution. A Caution is a short message which calls attention to possible equipment damage or destruction unless specified procedures are followed and safety precautions presented are observed.

6.4.4 Confirming events. Confirming events are indications which are not necessarily steps of the task or subtask itself, but are necessary to provide assurance that the task has been performed correctly. They confirm the correctness of the technician's actions and confirm that the equipment is operating properly.

6.4.5 Data pane. A data pane is a rectangular region within the client area which contains the displayable image of a single data type.

6.4.6 Dynamically generated fault isolation recommendations. Dynamically generated fault isolation recommendations are computed as required with information gained from user and/or system outputs.

6.4.7 Descriptive information. Descriptive Information is that technical information typically contained in a technical manual which provides to an end user the background, theory of operation, and other supporting information which is necessary for performance of maintenance, operation of the system or equipment, and the training and logistic support for that system or equipment. Descriptive information is non-procedural in form and, in an IETM, is generally supplemental information to assist the user in the comprehension of procedural data. Examples of descriptive information include theory of operation, diagrams, and general knowledge.

6.4.8 Element Links. Element links are explicit associations between two bodies of information which allow a user to branch from the immediate technical information to other related information. The links are of two types. The first type provides for a one-to-one direct relationship between two pieces of information. The second type provides relationships to exist between several pieces of information. The links are not restricted to any one data type. They are available for use with all data elements.

6.4.9 Graphic Overlays. Graphic overlays are hierarchical and logically grouped graphics specifically designated to visually overlay a master graphic and one another. On a display system they are combined and displayed as one picture.

6.4.10 Interactive Electronic Technical Manual (IETM). A technical manual, prepared (authored) by a contractor and delivered to the Government, or prepared by a Government activity, in digital form on a suitable medium, by means of an automated authoring system; designed for electronic window display to an end user, and possessing the following three characteristi cs:

a. The format and style of the presented information are optimized for window presentation to assure maximum comprehension; that is, the presentation format is "frame oriented", not "page oriented".

b. The elements of technical data constituting the IETM are

so interrelated that a user's access to the information he requires is facilitated to the greatest extent possible, and is achievable by a variety of paths.

c. The computer controlled IETM display device can function interactively (as a result of user requests and information input) in providing procedural guidance, navigational directions, and supplemental information; and also in providing assistance in carrying out logistic support functions supplemental to maintenance.

6.4.11 Note. A note is a short message which describes an unusual procedure or condition to which special attention must be paid for any reason (but it may not replace a caution or warning).

6.4.12 Predefined Fault Isolation Sequences. Predefined fault isolation sequences are representative of the fixed fault trees in fault isolation manuals. Based on an observed symptom, the user will proceed through a prespecified sequence of procedures and tests that will eventually lead to the suspected fault.

6.4.13 Troubleshooting technical data. Technical data designed to permit fault isolation in corrective maintenance, troubleshooting or fault isolation technical data is a special type of procedural technical data (differing primarily in the interactivity involved between display device and technician, and in the presence of extensive branching in the logic).

6.4.14 Warning. A warning is a short message which calls attention to possible personal injury, loss of human life, or a long term health hazard unless indicated procedures are followed and identified safety precautions observed.

6.5 Subject term (key word) listing.

Data Base
Dialog
Electronic Display System
IETM
Technical Manual, Interactive Electronic
User Interface
Window

Custodians:
Air Force - 16
Army - TM
Navy - AS

Preparing Activity:
Air Force - 16

Review Activities:
Air Force - 11, 13, 14, 18, 19, 30, 70, 71, 80, 82, 84, 99
Army - AL, AR, EA, AV, CR, MI, AT, TR, SC, PT

(Project TMSS-0296)

Navy - AS, EC, MC, SA, SH, TD, YD

User Activities:
Air Force - 11, 13, 14, 18, 19, 30, 70, 71, 80, 82, 84, 99
Army - AL, AR, EA, AV, CR, MI, AT, TR, SC, PT
Navy - AS, EC, MC, SA, SH, TD, YD

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